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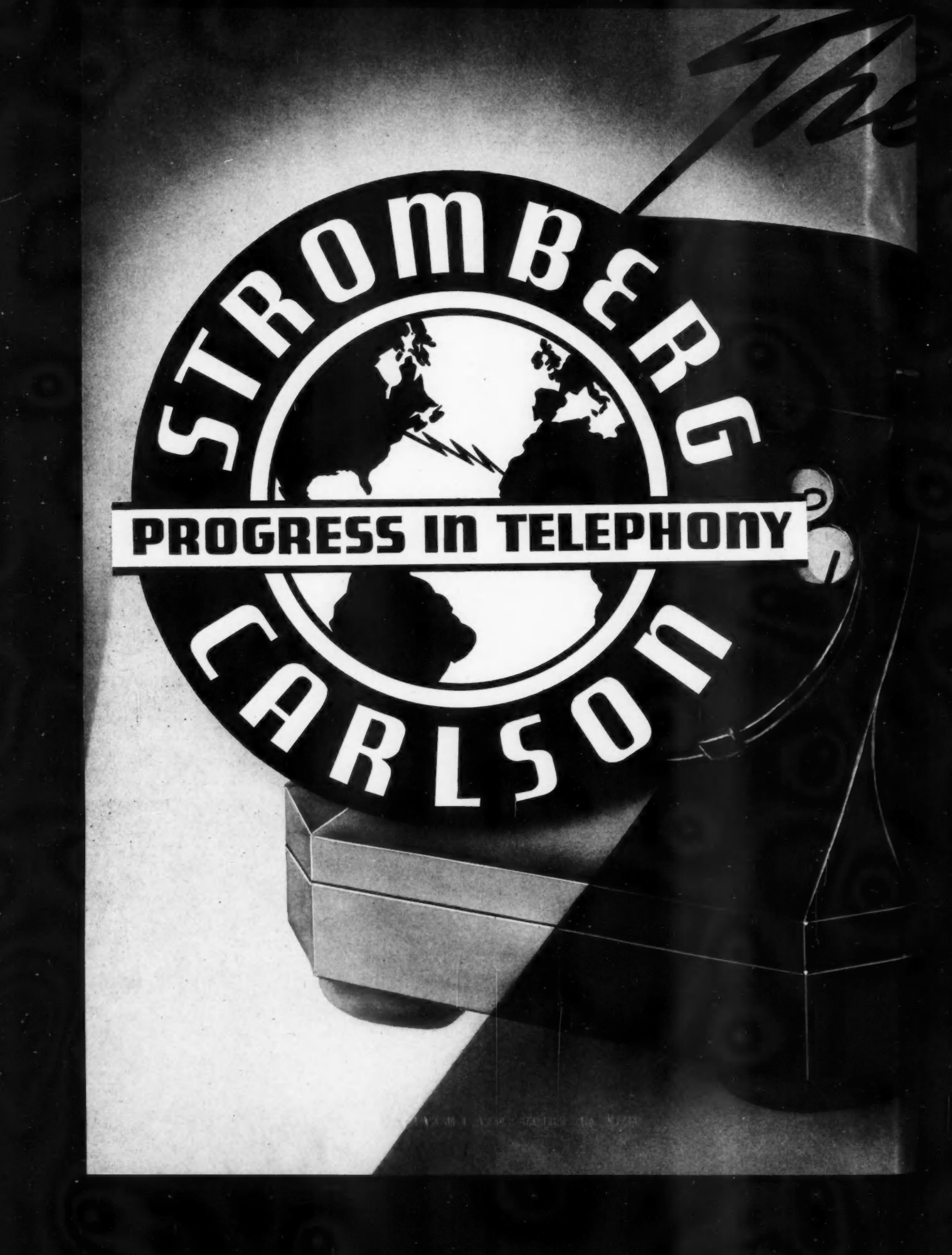
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The Journal of the Telephone Industry

JANUARY 6, 1945

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ABC of the Telephone

By FRANK E. LEE

PART VII. Capacitance vs. Self-Inductance. The sixth article in this series appeared in the December 9 issue, page 21.

A DISCUSSION and study of the telephone must never lose sight of its function, the transmission of sound. The essential units are the transmitter, receiver, battery and connecting wires. Because of the effects of distance and the necessity of improving transmission, additional equipment is placed in the circuit.

Sometimes an added factor, although improving the operation of the circuit, will create a detrimental effect which must be overcome. As a result of this, further changes are often necessary until the circuit provides the improvements without the associated disadvantages.

An example of this particular condition arises when an induction coil is placed in the circuit. Theoretically, the receiver will operate more effectively with alternating current than with fluctuating direct current. Actually the receiver itself creates a condition which impedes the free movement of alternating current through its coil windings. This condition, separate from the physical resistance of the coil windings, is peculiar only when alternating current is present and is not involved with the flow of direct current.

In a preceding installment it was pointed out how an expanding or collapsing magnetic field induced current from a primary coil into a secondary coil. With this thought in mind it is but a short step to consider the possibilities of current being induced between individual windings of a single coil.

A coil, similar to a receiver coil, is shown in *Fig. 1*. Current is just starting to flow through the coil in the direction indicated. It will be noted the current is flowing "in" at the top of the coil and "out" at the bottom of the coil.

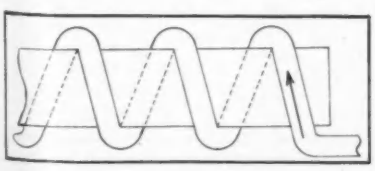


FIG. 1.

A cutaway section of the coil, minus the iron core, is shown in *Fig. 2*. As the current starts through the first turn of wire an expanding magnetic field is created which induces a current in the neighboring winding. The current induced in the neighboring winding is in a direction opposite to the main current flowing in the first winding. The net result: It takes a little longer for the current to establish itself in a coil of this type than through a straight length of wire.

The induction of currents within a single coil is called self-inductance. Once the current through the coil reaches a constant value the magnetic field becomes stabilized and the self-inductance is no longer present. From this it can be said that self-inductance retards, establishing a flow of current through the coil.

When the circuit is opened the magnetic field around the coil collapses. The collapsing magnetic field induces a current in the windings of the coil which tends to keep the current flowing in the original direction. Here self-induction tends to keep the current in motion. *Fig. 3*.

The effect created by self-inductance in a coil has led to comparing it with

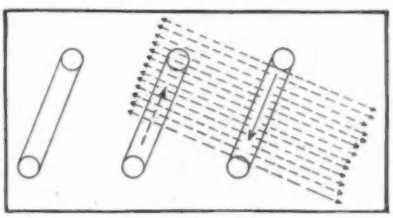


FIG. 2.

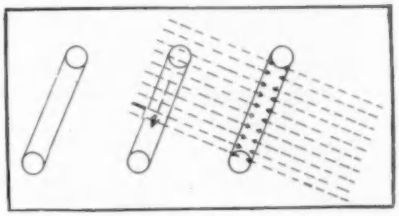


FIG. 3.

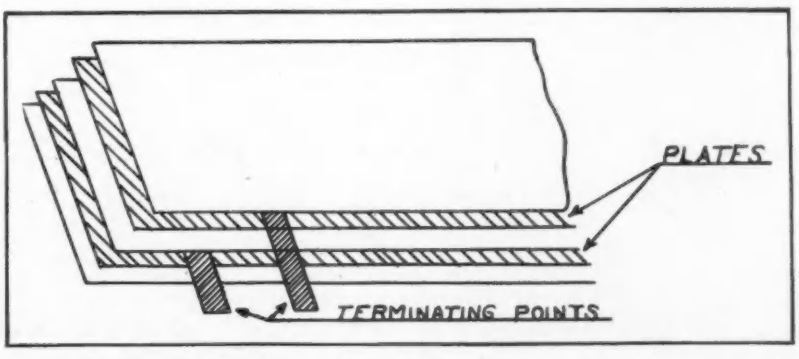


FIG. 4.

inertia. Inertia is that property of matter by which it tends, when at rest, to remain so, and, when in motion, to continue in motion, in the same straight line or direction unless acted upon by some external force. A good example of inertia is a man seated sideways in a car. When the car starts—he bends sideways in the direction from which the car started. When the car stops, he again bends sideways, but this time in the direction in which the car is going. His body resists being put in motion from a state of rest, but once it is in motion it resists being stopped.

In a coming installment an explanation will be given when similar coils are used to prevent rapid changes of current flow. As such, the coils are known as choke, retard or retardation coils. The degree of efficiency of a retard coil depends upon the number of turns of wire in the core and the size of the soft iron core. The receiver coils do not oppose rapid changes in current flow as much as does a well-designed retard coil. This, notwithstanding, does not alter the fact that the small amount of self-inductance inherent in the construction of the receiver opposes the flow of alternating current in the secondary or receiver circuit.

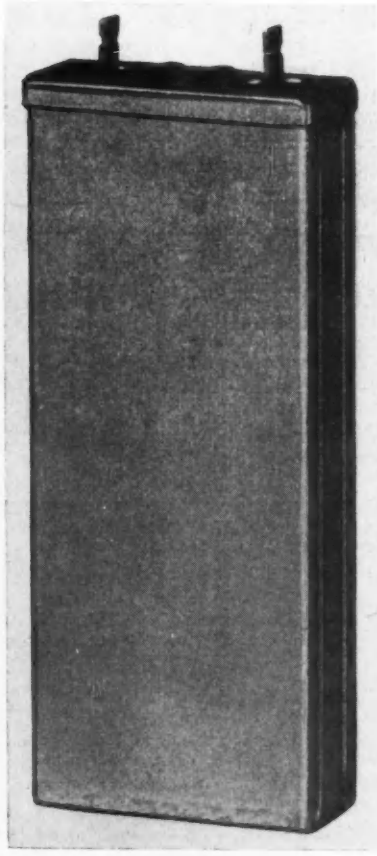


FIG. 5.

If the self-inductance in the receiver coils opposes changes in direction of the alternating current created in the secondary induction coil winding; then, the receiver will be out of phase with the changes of current created in the induction coil. The two units will not be coordinated. The self-inductance in the receiver will not permit the current in the circuit to change direction the moment a reversal is originated by the induction coil.

The answer to the problem centers around building up the current in the receiver circuit the instant the induction coil starts to reverse the current. A balancing effect is needed. Obviously, the balance must be instantaneous in action. Also, the balance must be effective when the current in the receiver circuit is flowing in either direction.

A condenser is a piece of apparatus which may be placed in a circuit to act as a balance for the self-inductance of the receiver coil windings. Besides being used as a circuit balance a condenser may be placed in other circuits to:

(1) Open a circuit to direct current.
(2) Permit a current with alternating characteristics to flow in the circuit.
(3) Furnish a cushion effect for current discharge.

Fig. 4 illustrates the makeup of a condenser. It consists of two sheets of tin-foil placed close to each other but separated by an insulating material such as waxed paper. The two sheets of foil are referred to as the plates and the waxed paper as the dielectric. A terminating point is attached permanently to each plate for the purpose of making required connections.

To make the unit compact the two plates and the dielectric are placed between two additional pieces of waxed paper to keep the plates apart when folded and placed in a metal container. The metal can is larger in all dimensions than the compact folds of paper and foil. The extra space in the can is filled with a sealing compound such as tar or pitch. The sealing compound prevents the entrance of moisture to the completed unit. A standard condenser as used in a telephone circuit is shown in *Fig. 5*.

Condensers are made in different sizes, the size being governed by their use in the circuit into which they are placed. When voltage is applied between the condenser plates, charges flow in the circuit so that one plate has an excess positive charge, the other an equal negative charge.

If only a small current flows when a given voltage is applied to a condenser, that condenser has a small

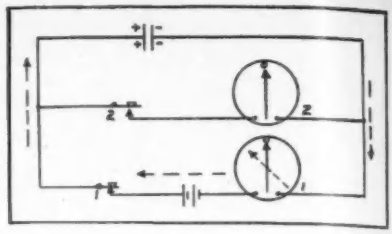


FIG. 6.

capacity. If a large current flows to charge the condenser to a given voltage, the condenser is said to have a large capacity. Capacity is measured in units called farads. The capacity of an ordinary condenser is only a small fraction

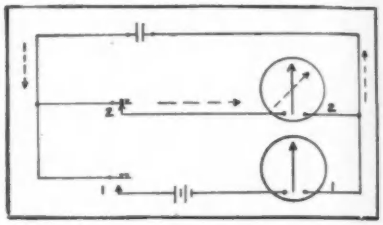


FIG. 7.

of a farad, therefore, for the sake of convenience, the capacity of a condenser is expressed in microfarads. The microfarad is one-millionth of a farad. In writing about, or indicating current capacity of a condenser in a schematic drawing, the abbreviation M.F. is used. The most common condensers used in telephone work have a capacity of either one or two M.F.

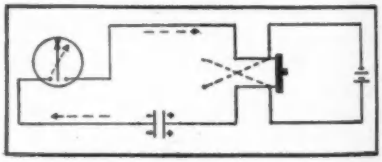


FIG. 8.

Fig. 6 shows a combination of two circuits. In circuit 1 a battery, push button and a meter are placed in series with a condenser. Circuit 2 has the same condenser in series with another meter and push button. Closing push button 1 causes a momentary current to flow in circuit 1 as indicated by the deflection of the meter needle. Plate 1 of the condenser, connected to the positive side of the battery takes on a full positive charge. Likewise, plate 2, be-

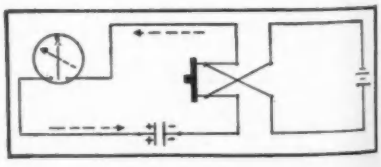


FIG. 9.

ing connected to the negative of the battery, takes on a full negative charge.

Up to a certain point, the breakdown point of the condenser, the "full charge" mentioned above is governed by the voltage of the battery rather than by the capacity of the condenser.

If push button 1 is operated repeatedly there will be no more movement of the meter needle, because the condenser is already fully charged. The condenser would hold the positive charge on one plate, and the negative on the other, for an indefinite period. After the initial surge of current a direct current will no longer affect the meter, therefore, the circuit is open to direct current.

In *Fig. 7* push button 2 has been closed and the momentary movement of the needle of meter 2 indicates that the current caused to flow from one plate to the other has returned through circuit 2. From this illustration it can be seen that the condenser returns to the circuit the same amount of current that it took to charge it. With a direct short across the condenser terminals the condenser is discharged.

From this example it can be seen that while a storage battery stores electricity as another form of energy, the condenser, in a smaller way, stores electricity in its natural state. As a container, a condenser can well be compared to a closed tank filled with compressed air. The quantity of air, since air is elastic, depends upon the pressure as well as the size of the tank.

Comparing a condenser with an air tank affords a better simile than picturing a condenser as a container, such as a pail or bucket, with a more or less fixed capacity.

Fig. 8 shows a condenser, meter and a special reversing switch in series with a battery. The dotted line indicates the direction in which the current flows to charge the condenser. The distance the needle of the meter is deflected is proportional to the amount of current that flows at this time. If the switch is opened the condenser will retain its charge, and closing the switch to the same position again and again will not deflect the needle.

However, when the reversing switch is closed, as indicated in *Fig. 9*, to connect the battery in reverse as compared with *Fig. 8*, the amount of current that flows momentarily in the circuit will deflect the needle of the meter approximately twice as far in the opposite direction. This is caused by the condenser discharging and then charging in the opposite direction. Speaking of the amount of current needed to charge the condenser as one unit, it takes one unit to charge the condenser in *Fig. 8*. In *Fig. 9* this original unit of current has to flow through the meter to discharge the condenser, and then an additional unit must flow to charge the condenser in the opposite direction.

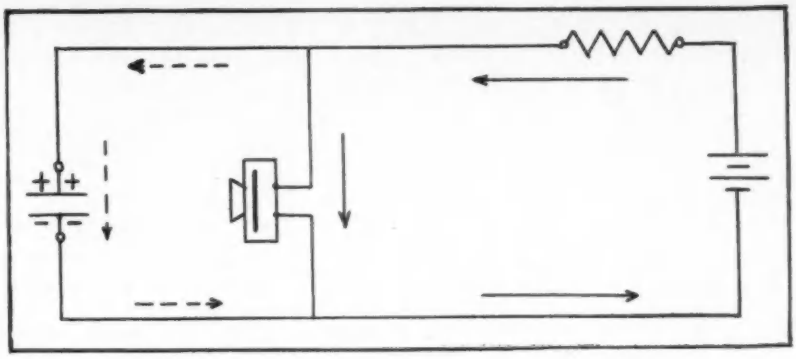


FIG. 10.

A condenser is connected across the terminals of a transmitter in *Fig. 10*. The resistance in the transmitter forces some of the current to charge the condenser to a voltage equal to the voltage used to force the current through the transmitter. The resistance in the battery circuit acts as a fixed control on the total amount of current that can flow in the circuit. As a result, the transmitter will cause only a small change in current flow compared to the conditions which would be present if the fixed resistance were removed.

The transmitter diaphragm has moved inward, *Fig. 11*, to reduce the resistance of the unit. The reduced transmitter resistance also reduces the resistance across the condenser terminal. As indicated by the arrow, the condenser will discharge to equalize itself with the voltage measurement across the transmitter at this time.

An increase in transmitter resistance, *Fig. 12*, forces more current to charge the condenser. Current flows in the condenser circuit until the condenser charges to the voltage measurement across the transmitter terminals.

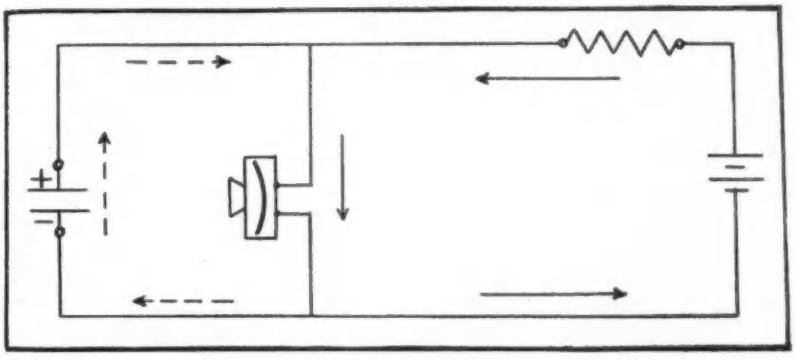


FIG. 11.

Voltage readings are obtained by measuring the loss in voltage or drop in voltage as the current is forced through a resistance. In simple terms the measurement is called voltage drop, (abbreviated VD). When the transmitter or other variable resistance is

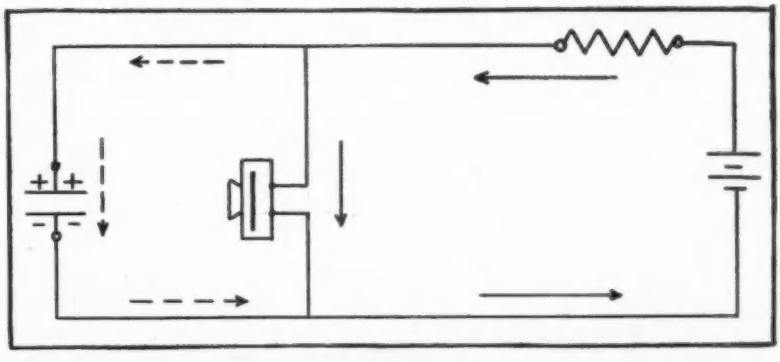


FIG. 12.

connected across the terminals of a condenser, the condenser will charge and discharge in accordance with the change in the voltage drop across the transmitter.

Therefore, a condenser may be made to increase and decrease its charge by varying the resistance of a transmitter placed across its terminals. This statement is based on the assumption that a current is flowing through the transmitter and there is resistance in the current supply.

Electric current traveling with the

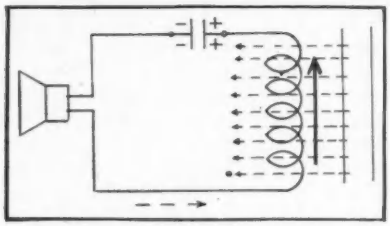


FIG. 13.

speed of light at 186,000 miles per second appears instantaneous in action. In the demonstration with the reversing switch, once the condenser is charged, the current flowing from the charged condenser acts in the circuit simultaneously with the current from the battery which is charging the condenser in the new direction of polarity. Therefore, the current at the time of reversal is of increased value as compared with the battery alone.

The addition of a condenser to the circuit places additional capacity or capacitance in the circuit. In the secondary circuit a condenser of the proper size is used to balance the inductance of the receiver coil windings.

The coordination of the three ele-

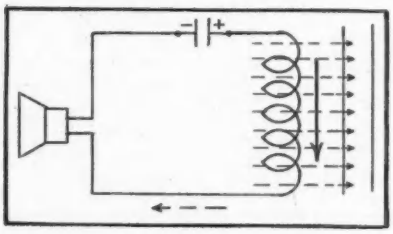


FIG. 14.

ments in the secondary circuit is emphasized in the following series of illustrations. The three elements are:

(1) Secondary induction coil winding (source of energy);
(2) Inductance of receiver (opposition to change), and
(3) Capacitance of condenser (aid to energy).

ACTION A: *Fig. 13.* The expanding magnetic field of induction coil creates current in the secondary circuit. The

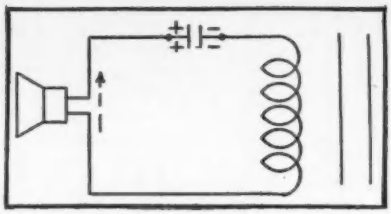


FIG. 15.

induced current charges the condenser as indicated.

ACTION B: *Fig. 14.* The collapsing magnetic field creates current in new direction in secondary winding. At this time the charge stored in the condenser is aiding the new induced current in reversing the current in the circuit. The inductance of the receiver windings tends to oppose any change in the direction of current in the circuit. The current is reversed immediately because the new current created in the induction coil has the added impetus of the charge stored in the condenser.

ACTION C: *Fig. 15.* A continuation

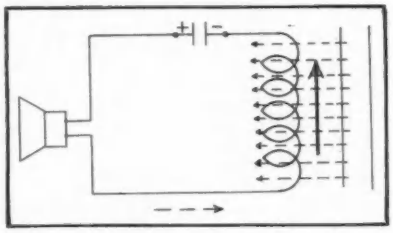


FIG. 16.

of the full cycle of Action B. The inductance of the receiver coil windings is helping the induced current to charge the condenser. The absence of arrow on the magnetic field markers indicates a stabilized field. The inductance by maintaining current flow for an instant after the field has stabilized aids in full charging the condenser. Note the condenser is charged to the new direction or polarity.

ACTION D: *Fig. 16.* This action is similar to Action B. The magnetic field is expanding and is creating current in the inductance coil winding in a new direction. Here, again, the charged condenser is helping the new induced current in overcoming the inductance in the circuit.

Each time the current created in the secondary winding of the induction

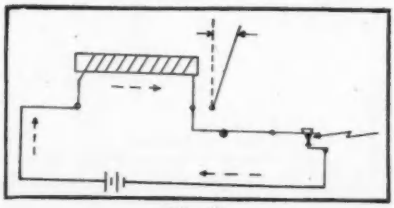


FIG. 17.

coil starts to reverse itself, the stored-up charge in the condenser aids the induced current in its new direction. The condenser discharge gives the new current enough of an extra "boost" to overcome the inductance in the circuit.

The inductive effect of a receiver in a circuit may be neutralized almost entirely, if a condenser of the proper capacity is included in the circuit. The time interval between the reversals of current in the secondary depends both upon the capacity of the condenser and the inductance of the coils. If the

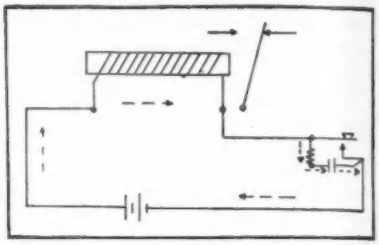


FIG. 18.

time between the reversals of the induced current in the secondary winding of the induction coil is the same as that between the reversals which the capacity and the inductance tend to cause, the resulting current flow will be the same as if neither capacity nor inductance were in the circuit.

The condenser, used as a circuit balance, improves the operation of the receiver because alternating current is permitted to flow unhindered in the circuit.

The remaining use for a condenser in a circuit, as a cushion for circuit discharge, can be described by drawing upon information previously presented.

Relay windings (relays will be covered in detail in a coming installment) are quite similar in all respects to re-

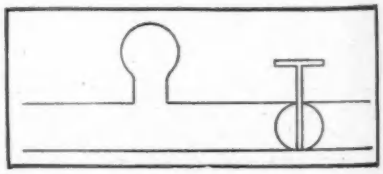
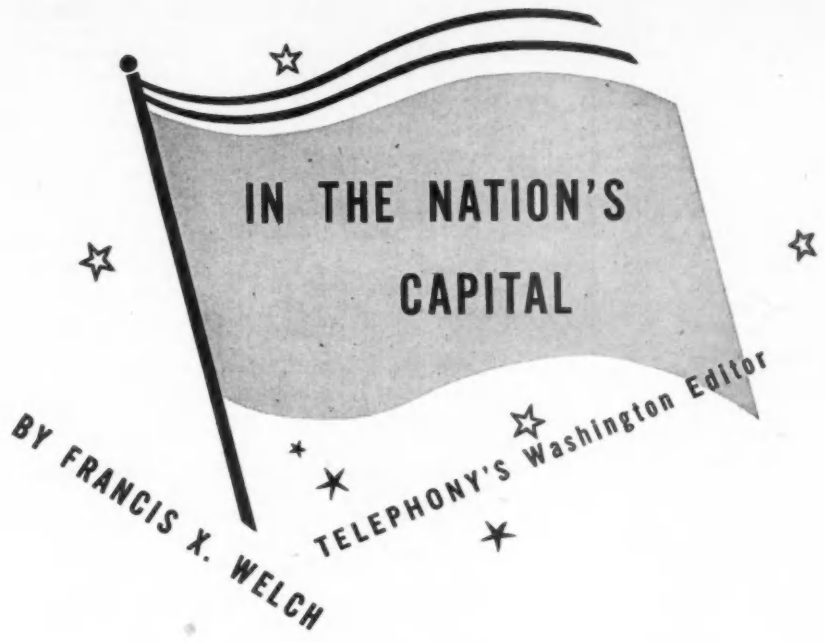


FIG. 19.

ceiver coil windings. The relay winding is used as a source of electromagnetism. It also places self-inductance in a circuit which tends to keep current flowing once it has been established. In *Fig. 17* the surge of current causes a spark to arc through the air gap between the contacts when the push button is opened. In time this excessive arcing would burn away the contacts and the push button would not operate.

Fig. 18 illustrates that by placing a condenser in series with a non-inductive

(Please turn to page 35)



Employes as well as management have much at stake in warding off further government entrance in private business, says Mr. Welch in discussing RTA bill. . . . Points out the complete loss of labor's freedom and privileges in countries where government became all-powerful.

RECENT happenings inside and outside Washington have made two mighty important topics loom large in the minds of all alert telephone men —and rightly so. They are: (1) The possibility of the introduction of government ownership in the telephone field, and (2) the need for stabilizing and consolidating the industry's employe relations. Offhand, these topics would seem to be wholly independent and unrelated. But after giving all discernible angles some thought, this writer wasn't so sure that there isn't or couldn't be a very vital connection between the two. Going further, there emerges the possibility that with entirely successful treatment, these problems might cancel each other out.

Let's go back for perspective to the factual background which points up these two issues: *Government Ownership* and *Labor Relations* in their present settings of special significance. The government ownership question was obviously raised by the recent introduction of the Hill Bill in Congress—purpose of which was to set up a Rural Telephone Administration (RTA) to make loans for expanding and improving telephone service to farms along lines similar to the more familiar Rural Electrification Administration operations. The bill would specifically give states, municipalities, co-ops, and other public and quasi-public agencies a preferred status for such loans and thus introduce for the first time in this country an element of permanent government operation in the telephone business.

We must recall, also, that this bill was preceded by a barrage of criticism from the Federal Communications Commission staff and several of its members against the failure of the private telephone industry to supply adequate rural telephone service. This justifies the conclusion that there is substantial administration support behind this measure, that it will be reintroduced (in some form or another) in the new Congress, and that the possibility of final legislation along this line simply cannot be discounted.

Now as to the labor issue: The recent announcement by the National War Labor Board of a special national panel for disputes arising in the telephone industry comes as a climax to a series of maneuvers in the communications field, generally with respect to collective bargaining, wage claims, and so forth. The new telephone panel is expected to be composed of representatives of the public, industry (Bell and Independent), and labor, and gives recognition to the National Federation of Telephone Workers, which is especially noteworthy since the War Labor Board has heretofore shown no particularly sympathetic attitude towards so-called "independent" unions—meaning unions not affiliated with either the AFL or CIO.

On the other hand, in the allied telegraph industry field, the recent decision of the National War Labor Board to hold the collective bargaining election for the 60,000 Western Union employes in seven districts (instead of on an industry-wide, as well as nation-wide basis) has resulted in open charges by President Green of the AFL that Chairman Millis of the NLRB and one member, John Houston, have unduly favored the CIO. The CIO comes back and demands the resignation of Gerald Reilly, another NLRB member, because he dissented from the viewpoint of Millis and Houston.

Coming back to the telephone industry, it must be admitted that its labor relations have deteriorated on the av-

erage during the year 1944, and so far have shown no signs of rapid and satisfactory improvement. The Thanksgiving Day strike of Ohio Bell long distance telephone workers, which brought that branch of the Bell System within the shadow of government seizure, was bad enough. But it may not even be the high point. Just before Christmas, employes of the Long Lines Department of the AT&T in New York voted to strike within 30 days unless WLB approves a $5 a week increase already recommended by a general WLB panel. Similar strike votes by long distance operators have been taken in Philadelphia, St. Louis, and Kansas City, with some support indicated from local telephone operators.

The Independent industry has had its problems as well. Foremost, perhaps, was the Illinois Commercial Co. decision of the WLB which threatens to sweep away the statutory operator exemption approved by Congress in 1939 for the protection of the small telephone exchanges serving less than 500 subscribers.

The reasons underlying this unsatisfactory state of affairs are, for the most part, the result of war expediency. The telephone industry as a whole has been called upon to carry a double burden of service with a greatly subtracted supply of manpower and womanpower and little, if any, assistance in the form of additional net revenues. On top of this the industry is faced with such complications as: (1) Competition from war-boom industries in the form of high wages; (2) the perfectly understandable resentment of senior employes against differential wage allowance allowed to newcomers brought in from the outside in high-pressure localities to bridge the gap in local labor supply. Nobody especially is to blame for these circumstances, unless it be the axis lunatics who started the war which has spawned such mischief.

Why was a special national telephone panel needed? It was doubtless intended by WLB to head off the ominous threat of strikes, now looming on the horizon, through prompt and satisfactory settlement of labor disputes in the telephone industry. Whether it will accomplish this remains to be seen. But it is at least recognition by the WLB of the vital character of the public service rendered by the telephone industry and the necessity for keeping its operations going at all costs.

So much for background on our two major topics of interest in the field of telephone-government relations as this new year begins to sheave the leaves from the calendar of what promises to be a most critical milestone in our national history. Now for the connection between the two. First of all, it will be necessary for the telephone industry, including both Bell and Independent branches, to make up its mind whether it wants to appease the promotors of government ownership in the telephone industry by writing off the rural end of the business and even hoping to pick up a few crumbs of subsidy which might fall in the path of the private industry if the Hill Bill becomes law.

It is difficult for this observer to believe that the lure of cheap money loans accompanied by the chains of government regimentation and competition is going to be effective bait to lull opposition by the industry to any camel's nose of government ownership under the tent of private enterprise in the telephone field.

True, an RTA setup might conceivably, under some circumstances, be a good thing for a few favored manufacturing or equipment firms which might profit from collaborating with the entrance of cities, states, co-ops, and others into the field of telephone operations. A few such concerns have made a pretty good thing out of the activities of the REA in the rural power field (as the recent investigation of REA by the Senate Agriculture Committee revealed).

But for the *operating* companies in the telephone business it is hard to see how the advent of RTA, at least in the form proposed in the Hill Bill, will be any less of a dose of double trouble than the advent of REA has been to the operating electric companies in rural service areas. This is especially true of the Independent operating companies which serve so largely in the rural areas. If it comes down to cases the Bell System, with its roots centered in larger cities, could better afford to write off rural business to government agencies. But to many small Independents, rural business is downright bread and butter.

Let us assume, therefore, that the telephone industry can and will unite in resisting enactment of the Hill Bill as introduced in the last Congress, or any similar legislation which will not protect the continuation of private enterprise, particularly small companies in the telephone industry.

How can the industry best accomplish this objective? Before answering that question let us consider an episode which happened in the state of Washington just last fall. More than two years ago, a leading figure in the labor movement in Washington expressed surprise that management of a privately-owned electric utility there did not come to the labor leaders for active aid in fighting public ownership and operation in the power field.

This public power movement has made great strides in Washington and last year when a state-wide referendum on the subject of allowing public utility districts to merge for the purpose of acquiring entire electric systems came up for public approval, political observers were inclined to write off the private power industry of Washington as a dead duck.

COMING TELEPHONE MEETINGS

Georgia Telephone Association, Henry Grady Hotel, Atlanta, January 17 and 18.

Minnesota Telephone Association, St. Paul Hotel, St. Paul, January 23, 24 and 25.

Texas Telephone Association, Baker Hotel, Dallas, March 12 and 13.

Kansas Telephone Association, Hotel Kansan, Topeka, March 15 and 16.

Kentucky Independent Telephone Association, Lafayette Hotel, Lexington, March 20 and 21.

Tennessee Independent Telephone Association, Nashville, March 23. Hotel not yet decided.

Iowa Independent Telephone Association, Hotel Fort Des Moines, Des Moines, April 3 and 4.

Nebraska Telephone Association, Hotel Lincoln, Lincoln, April 5 and 6.

Spring Executives' Conference of the United States Independent Telephone Association, Edgewater Beach Hotel, Chicago, April 10 and 11.

Illinois Telephone Association, Hotel Pere Marquette, Peoria, April 19 and 20.

Ohio Independent Telephone Association, Deschler-Wallick Hotel, Columbus, April 24 and 25.

Indiana Telephone Association, Claypool Hotel, Indianapolis, May 9 and 10.

Pennsylvania Independent Telephone Association, Hotel Lawrence, Erie, May 22, 23 and 24.

New York State Telephone Association, Hotel Syracuse, Syracuse, June 6 and 7.

But electric utility management in Washington finally decided to talk things over with labor leaders. As a result, this management made the interesting discovery that in time of trouble the best way to beat socialism is to call on the loyalty of the employes of private enterprise for active cooperation and assistance. It did so in this instance and the referendum was beaten and beaten badly in the election of last November. The workers went out and rang doorbells and labor leaders made moving speeches in favor of private enterprise.

There should be no mystery about this natural alliance based on mutual loyalties and experience. It ought to be self-obvious. Yet we see as much confusion on the side of labor or some branches of labor as we do on the side of management. If the tragic events of the past decade of blood drenched history have proved anything at all, they have shown the following truths:

(1) When a labor movement tries to appease or collaborate with an aggressive government at the expense of private enterprise, it becomes itself absorbed, dominated, and its privileges restricted if not destroyed.

(2) When private industry tries to appease or collaborate with an aggressive government to save its own hide at the expense of demands of labor, it becomes itself absorbed, dominated, and its privileges restricted if not destroyed.

(3) If labor and management unite on a basis of mutual confidence and loyalty in the continuation of private enterprise it can check aggressive government persecution and regimentation with the overwhelming approval of public sentiment.

Cite the authorities for these generalizations? All right. Remember the labor movement in prewar Nazi Germany under the notorious drunken leader Robert Ley, who betrayed it, sold it down the river, and enslaved it body and soul to Hitler's lunatic program? Where is the right to strike or bargain collectively in Germany today, or, for that matter, even before the outbreak of World War II? These privileges have vanished amid the echo of phony speeches and pitiful receipts for advance installments on Strength-Through-Joy, popular automobiles, etc. Remember Thyssen, Stinnes and other right-wing German industrialists who thought they could do business with Hitler? Where are they today and what rights has private business in Germany? Perhaps it is not polite to talk about it, but we have pretty much the same picture in Soviet Russia where there is no right to strike or bargain collectively, and where public ownership is supreme.

We can't remind labor too often that the only place the right to strike and bargain collectively exists today lies within private enterprise, even here in our free United States. Go to work for the state or city, or the federal government, and see what happens to your right to strike or bargain collectively. Public ownership, as generally practiced, has put an end to the rights of labor so quickly that labor did not realize what had happened until it happened.

Example? For many years the Transport Workers Union dealt collectively and satisfactorily with the subway companies of New York. But as soon as the city acquired these properties these same unions found they no longer had the right as city employes to bargain collectively. Mayor LaGuardia told them what to do.

It probably was a sudden, shocking realization of this fact among responsible labor leaders which led to the last-minute settlement of the Ohio Bell long distance operators' strike. Seizure of the properties by the government would put an end not only to the strike but to the settlement of the workers' demands as long as the government continued in control of the properties.

Since, therefore, free enterprise and free labor can only exist hand in hand, why do we not have, here, the basis for an industry-wide reapproachment which would at the same time eliminate any serious threat of government ownership intervention? It might also go a long way towards aiding the industry to get a better public hearing in cases where future rate relief may be necessary. After all, if management cannot look for loyalty inside of its own organization, it can't look for loyalty outside. There is no question but that such loyalty exists. But there is so much confusion in the atmosphere that even the most sincere men and women of good will are in danger of being twisted around.

This is not to suggest that the industry should immediately sign up with any particular union. Local circumstances must govern each company and the right of individual employes not to join a union must be recognized where that is the prevailing sentiment. But talking this thing over between management and labor—this much bigger thing, namely, the threat of government ownership—ought to smoke out a lot of little thorns and burrs which have fretted employe relations. Sometimes trivial concessions on certain working conditions, abolition of useless or vexatious regulations, and generally treating employes more like persons and less like suspects or inmates of some institution will, in turn, establish a gracious sense of gratitude which will respond eagerly in favor of a friendly management.

Admittedly, educational work would have to bring both sides of this truism: That free labor and free private enterprise cannot exist independently of each other. This is not always understood by everyone. Some managements still fail to recognize that half a loaf shared with labor is better than a whole loaf swallowed up by government competition or taxation. There are some labor organizations (fortunately not noticeable in the private telephone industry) which have become so infiltrated with foreign and distorted political notions that they do not hesitate to place their vague ideological objectives ahead of their true and proper labor objectives. For them, severing diplomatic relations with some European regime which they do not like, or recognizing some other radical regime which they do like, is more important than a few more dollars a week increase or better working conditions for their own members.

The telephone workers, organized and unorganized, are not so silly. We can say that categorically, because really radical units have never been able to make the slightest headway in the telephone industry. And so, we do not have to contend with a labor movement in the industry which is so mixed up as to *prefer* government ownership because of some crazy notion that getting on the government payroll would mean more security and better employment opportunities. Telephone workers, by their very calling, are necessarily high-grade, intelligent people who have enough common sense to realize that if everybody jumps in the sled, nobody is going to ride very far.

Yes, men and women in the telephone industry will respond quickly enough to the proper treatment and the proper educational methods to a shrewd acknowledgment that their own best interests are bound up with the continuation of free private enterprise. When that realization becomes universal the industry will be in a position to take on, with full confidence, anybody who thinks he can make an inch of headway in the direction of socializing the telephone business.

>> *The work an unknown good man has done is like a vein of water flowing hidden underground, secretly making the ground green.*—**Carlyle**

SOUND RECORDERS AND VALUE OF TELEPHONE SERVICE

By F. E. NORRIS
Vice President
Associated Telephone Co., Ltd.
Santa Monica, Calif.

THE IDEA of using sound recording devices as an adjunct to telephone service has received considerable attention in recent months. Not that this is a new idea, for it is anything but that. High quality sound recorders suitable for connection to telephone circuits have been available for many years. Perhaps the interest in these devices at this time arises out of the stimulated use by governmental agencies since the beginning of the war and by the variety of recorders now being manufactured for various uses outside of the telephone field. These uses, as well as possible uses by the telephone industry, are generally known and need not be repeated now.

My comments will be confined to one particular use, one which I think is of great importance to the industry, and that is, the recording of both sides of a regular commercial telephone conversation. It seems to me that the primary concern with respect to using sound recorders for this purpose is whether they will tend to inhibit the free and easy use of the telephone and thereby impair its popularity or whether their use will make the telephone more valuable, and thereby add to its popularity.

A lead to an answer to this question is for one to ask himself whether he would use the telephone as frequently and speak as freely and easily and in the usual conversational vein if he knew or even suspected that the fellow at the other end would record the conversation. This hypothesis was presented to a number of persons who indicated that a restraint in the use of the telephone would be created by the mere suspicion that a record of their conversation is being made. There also was an indication on the part of some that if they suspected a record would be made, the conversation would be limited to notes set down in advance of placing the call. Results such as these can hardly be said to be conducive to the popularity of the telephone. Further, should such results generally prevail, might not the use of sound recorders tend to divert many potential toll messages to other communication media, for example, the mails. Competition from this source, particularly since the inception of air mail, is something about which our industry is not entirely unconcerned.

As contrasted to this point of view, there are some who believe that our industry should promote the use of sound recorders. It apparently is their feeling that this equipment offers to the industry a means of meeting the competition of other forms of recorded communication, such as the telegraph and, possibly at some future date, the teletype.

Sound recorders may have advantages under certain conditions. They no doubt would be of value in recording telephone conversations where discussion develops the course to follow in matters where accuracy is paramount, action cannot await correspondence through the mails and recording the conversation in shorthand is impractical. But such instances do not prove that it is in the best interest of the telephone industry to promote the use of sound recording equipment.

If there is a real demand for recording equipment, the idea of revising telephone company tariffs to permit its use, probably will receive support. On any other basis its use would be unauthorized, for service contracts generally prohibits the use of foreign attachments and an unauthorized recording device would be just that whether the intelligence from the telephone line is received through physical or inductive pick-up. But to say that the telephone company should permit the use of sound recording equipment on its lines should not prompt us immediately to decide to file rates for that service. In my opinion, we should wait until a genuine demand is known to exist.

From the experience in the company with which I am associated, serving some 180,000 stations, and from my investigation of other companies, I find there is not at present a demand for sound recording equipment. If a demand for this equipment should later develop, I believe we should not overlook the importance of the tip that Walter S. Gifford, president, American Telephone & Telegraph Co., gave in his speech before the USITA convention in Chicago last October. His words suggest that if recording service is furnished, it should be in accordance with legally filed tariffs, and that an announcement be made automatically to the user at the other end of the line that the convensation is being recorded.

We may expect to hear more about sound recorders after the war. Much can be said for and against their use. It is not too early to give this subject some thought in order that an opinion may be formed as to whether the use of this equipment is in the public interest. If we think it is, then the limitations, if any, which should be imposed upon its use, should receive serious consideration.

V V

Develop Gun Director In Bell Laboratories

Dr. Clarence A. Lovell and Dr. David B. Parkinson of the Bell Telephone Laboratories recently announced the development of an electrical gun director.

Dr. Parkinson told associates that he first got the idea for the gun director in a dream one night in 1940. The device was developed with the aid of Army ordnance scientists.

About the size and shape of a big household refrigerator, the gun director consists of a tracker, computor, range converter and power equipment —in all, 16,000 parts.

The director is so designed that dial movements instantaneously take into account such factors as air density, direction and velocity of wind and drift of the projectile.

In addition, its motor-driven telescopes follow the flight of an enemy plane or robot bomb without the aid of an operator.

Effectiveness of the electrical "brain" was demonstrated when anti-aircraft guns equipped with the director blasted 65 out of 140 one-ton robot bombs which the Germans fired across the English Channel.

V V

Becomes District Manager At Frederick, Okla.

E. H. Utzman, Brownwood, Tex., recently went to Frederick, Okla., to become district manager for the Southwest Telephone Co., succeeding L. M. Baker, who retired because of his health. Mr. Baker, earlier in the year, replaced R. H. Howle, resigned.

Mr. Utzman has been with the Southwest Telephone Co. for the past 14 years, more recently being stationed in the offices at Brownwood. He has had extensive experience in other Texas centers.

THE PLANT MAN'S NOTEBOOK

BY RAY BLAIN • TECHNICAL EDITOR

SOME one said that when the infantry goes into battle all they have in front of them is the enemy.

* * *

The "Federal Diary" in the Washington, D. C., *Post* states that Republic 7500 is the second largest private branch telephone exchange in the world, the Pentagon having the largest. This second largest private branch exchange has 7,000 lines and 15,000 stations installed in 65 buildings in Washington and its private lines extend to a number of large and distant cities. It serves 22 new war agencies. This switchboard could serve a city of 50,000 people. It has 120 employes and more than 40,000 calls are handled daily. This figure does not include the many thousands of interoffice calls.

* * *

We recently heard many reasons presented for the decline of farm line telephones. The writer will not attempt to solve this knotty problem, but would like to make a few observations and pass them on for what they may be worth. First, it is apparent that farm telephones removed during the depression in many communities never have been reinstalled. The farmers learned to get along without a telephone and from all indications they do not miss this service. We doubt that it is, at the present time and in the average case, a monetary consideration. It is suggested that a survey be conducted to determine why these farm stations have been lost permanently. Then, and only then, may we hope to approach a solution of the problem as a whole.

One possible answer is that since the depression the farm radio has increased in value until now it at least partially performs a service normally handled by the telephone. The farmer receives market and weather reports, also news events by radio and does not experience the feeling of isolation he formerly did without a telephone. Roads have been improved and are passable in all weather, and the number of automobiles on the farm has increased considerably. The average farmer likes to personally visit neighbors and, if he has no telephone, he has a good excuse to drive over and see them at almost any time. He likewise has a good excuse to drive into town of an evening for a talkfest.

In many localities, farmers have not welcomed selective ringing and have stated that they want to hear the neighbors' ring on the line. Perhaps by improving the service and eliminating the community interest in the party line, we removed the desire for a telephone in many farmhouses. Several practical, operating, telephone men with whom I have discussed this subject have voiced the same opinion. I, for one, do not claim to have an answer.

* * *

Within a period of four months the 143rd Armored Signal Company, now with the First U.S. Army in France, laid more than 7,000,000 feet of wire. This is considered a record by the members of the company, however, they are more proud of the repair job they have performed in the sectors assigned to them. Laying wire is only the beginning of the signalmen's job, it was pointed out. Keeping it in repair is a much bigger job. The tank, which usually is a big help to the wire-laying team, is also a wrecker of wire circuits. Repairing wire at the front often is more hazardous than the original laying task.

* * *

Freling Foster in *Colliers* says that of every 1,000 residence telephones in the United States, 295 are private lines, 443 are two-party lines, 208 are four-party lines and 54 are five-to-10-party lines.

* * *

Referring to an item which appeared on this page speculating as to why the idea of having cord circuit relays "jacked-in" was not more generally used, A. F. Wenzel, equipment engineer for the Rochester (N.Y.) Telephone Co. writes:

"Our company makes use of an arrangement whereby all of the equipment for a pair of cords or an interoffice trunk circuit is mounted on a single plate which may be removed with a screwdriver for test or repair."

It is stated that the arrangement proved most satisfactory.

Mr. Wenzel advises us that on December 22 he retired from active service, having completed 45 years of telephone service. We wish you many years of happiness, Mr. Wenzel, and hope you will continue to write us about things you read on this page even though it may take a little time away from your fishing.

**They Give Their Lives—
You Lend Your Money.
BUY WAR BONDS**

by MAYME WORKMAN
traffic supervisor
the Illinois Telephone Association
and traffic editor

THE OPERATOR'S CORNER

REMEMBER Ruth MacKay who presented such an interesting talk at the Traffic Conference at the annual meeting of The Illinois Telephone Association at the Edgewater Beach Hotel in Chicago, Ill., last spring? The following item by Herb Little in *Public Utilities Fortnightly* appeared in her "White Collar Girl" column recently.

"Considering all walks of female life, the telephone operator ought to strike the average eligible bachelor as the girl most likely to provide unusual, interesting and agreeable companionship. She's unusual because her job is neither a trade nor a profession—it's a calling. A man can marry one in confidence because he knows she'll ring true 999 out of 1,000 times. All told, you probably couldn't make a better connection. But don't try to fool her, pal, she's got your number!"

We agree with you, Herb Little, and would like to add our favorite axiom: Telephone operators make good wives because they are taught not to talk back.

Speaking of ringing true, did you ever answer a dial telephone and hear a voice at the other end of the line say, "Sorry, the operator gave me the wrong number?" We have that experience in our office occasionally. It gives one a sort of smug feeling, knowing the customer is at fault in dialing the wrong number.

An item appearing in the Riverside (Ill.) *News* had this to say on the subject of dial telephones and wrong numbers:

"'Dang, ding these dod-blasted dial telephones!' we heard a business man say as he got the 'wrong number.'

"Being a hibernated suburbanite and not accustomed to dial telephones, we jumped to conclusions that the mechanics of the dial telephones were being cursed by our businessman friend. So we very smartly commented: 'These modern inventions are not always as efficient as they are supposed to be.'

"'Efficient! They're too efficient. When I used to get a wrong number or bum service through an operator I could bawl her out and relieve my embarrassment. Now, with these doggone dial telephones, when I get a wrong number, I know I have no one but myself to blame'."

And there you have it, girls. Why the customer blames you when he calls a wrong number and you ring the number he asked for.

But he's a pretty good fellow at that, this customer. His bark is worse than his bite. He may do a lot of growling but at heart he is really very kind. He is just letting off steam and it happens to blow your way. If anyone else would criticize the telephone operator, he would probably be the first one to come to her defense, saying, "You lay off those girls. They are doing a good job. I placed a call to New York this morning and they had my party on the line before you could say 'Jack Robinson'."

Men are funny that way. I know—because I married one. They do a lot of blustering and loud talking and when it is all over they usually wind up saying, "Aw shucks, honey, I didn't mean it. I was just letting off steam."

If operators can keep this in mind when a customer gets edgy and blames her for reaching a wrong number that *he* called, if she can see the humorous side of it, she will smile and let him have his say. The customer will feel better and the operator will, too. She will realize he is not really shouting at *her* but at himself for calling that dod-blasted wrong number.

Of Mice and Men

In the guest book at the Chesapeake & Potomac Telephone Co.'s public telephone station in Williamsburg, Va., one soldier wrote this:

The service here is mighty fine;
The operators are divine.
I hope this don't get to my spouse;
Or she will think that I'm a louse.

Underneath it another soldier wrote this:

I think the service is good, too;
Every word I say is true.
I don't mind if it gets to my spouse
I'm a man—not a mouse.

—Transmitter

Questions from Illinois Operators

(1) Can information be secured for a subscriber not wishing to talk but wanting an address at a distant point?

(2) The phrase, "Can he be reached at another telephone?" is no longer being used. Is another phrase used, or are we not supposed to locate the called party unless the calling party requests it?

(3) Are "time of day" calls counted on a peg count?

(4) In taking peg count, should a local call be counted, and if they ask for Long Distance, should the call be counted again?

(5) What is the subsequent attempt on an inward messenger call?

The answers to these traffic questions are presented on page 38.

DESIGNED FOR TELEPHONE SERVICE

MODEL NO. 6

MODEL NO. 33

BOTH spring drive model No. 6 and electric drive model No. 33 Calculagraphs were designed specifically for telephone toll central office service.

Year after year these dependable instruments continue to be used for furnishing the essential time data for charging long distance calls. They furnish the net used time accurately, are simple of operation and have proved reliable for a service that requires the utmost in performance.

Calculagraphs are being used by the principal telephone systems throughout the world.

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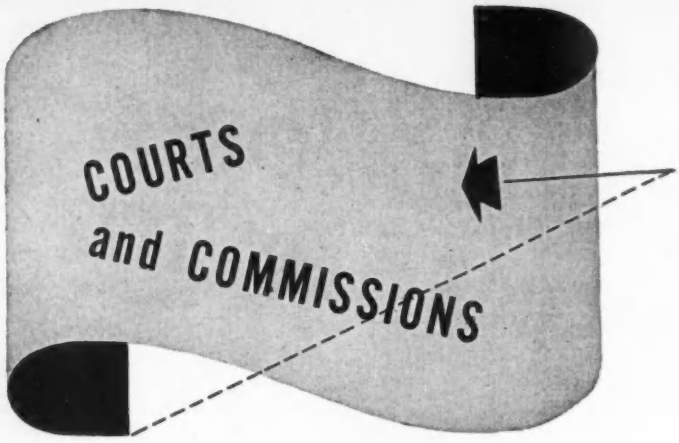


Alabama Commission Orders Rebates to Subscribers

Because the 1944 earnings of the Standard Telephone Co., Dothan, Ala., and of the Andalusia (Ala.) Telephone Co., a subsidiary, were deemed to be excessive, both companies were directed to refund 20 per cent of the amounts paid by subscribers in 1944, in an order of the Alabama Public Service Commission signed recently by Associate Commissioners W. Clint Harrison and Gordon Persons.

The refunds, amounting to approximately $45,000, will go to telephone users in 12 southeast Alabama towns and probably will be paid before the end of January, although the commission's order allows the two companies until February 28, to comply.

In a statement issued by the commissioners, it was said a study of the companies' earnings had been under way for some time and when the whole 1944 figures became available, "it appeared that the gross earnings were excessive and for this reason the refund was ordered."

Commissioner Persons said the 20 per cent refund meant that every subscriber would receive a check in an amount which would cover approximately 2½ months' telephone service. It was estimated that the Standard company would refund approximately $39,000, and the Andalusia company $6,000, a total of $45,000 for both.

The commission ordered that this total be withdrawn from regular bank accounts of the companies and deposited in a separate fund.

The order was a continuation of an investigation of the affairs of the Standard and Andalusia telephone companies which was started during the early part of 1944, at which time these companies were ordered to eliminate the "penalty" charge which had previously been assessed against customers if bills were not paid within a 10-day period and also the extra monthly charge for the use of handset telephones.

The amount of each refund will depend upon the type of local telephone service which the subscriber had during 1944 and also the length of time this service was in use.

V V

Paul Porter Appointed FCC Chairman by President

President Roosevelt on December 22 appointed Paul Porter, Democratic National Committee publicity chief, chairman of the Federal Communications Commission on a temporary basis, pending action by the Senate on his permanent nomination. (TELEPHONY, November 25, page 16; December 30, page 9.)

Shortly after the White House announcement, Mr. Porter was sworn in at the FCC's offices. The White House said that he would "get the benefit of experience" by starting his FCC career at once.

Since Chairman James Lawrence Fly resigned, Commissioner E. K. Jett has been serving as acting chairman.

V V

Illegal Use of Telephones Warrants Removal

Use of telephones in connection with horse racing bets will result in the removal of the telephones from restaurants, barbershops and other public establishments, the New Jersey Board of Public Utility Commissioners announced December 28.

The board sustained the legality of regulations adopted by the New Jersey Bell Telephone Co., Newark, providing that if the telephone is used in violation of the law, the service may be removed upon request of any governmental authority.

Commissioner Crawford Jamieson, Trenton, one of the three members of the board, concurred in the board's conclusion, but refused to go along with its reasoning.

In a separate opinion, he expressed the belief that the company is lax in checking up on illegal uses made of the telephone. He pointed out that there are 51,000 applicants for telephones in New Jersey at the present time who cannot obtain service because of lack of equipment, but "It is rather obvious that thousands of telephones are being used to take horse bets."

"While it is true that the statute does state that the company is guilty only if it shall knowingly carry any message or promote the interest of any unlawful pursuit, it is no excuse under the law to escape knowledge by turning one's head away from obvious information," he said. "The laxity of the company's policy is so great that it constitutes a co-operation with the 'bookies' in the conduct of their illegal business."

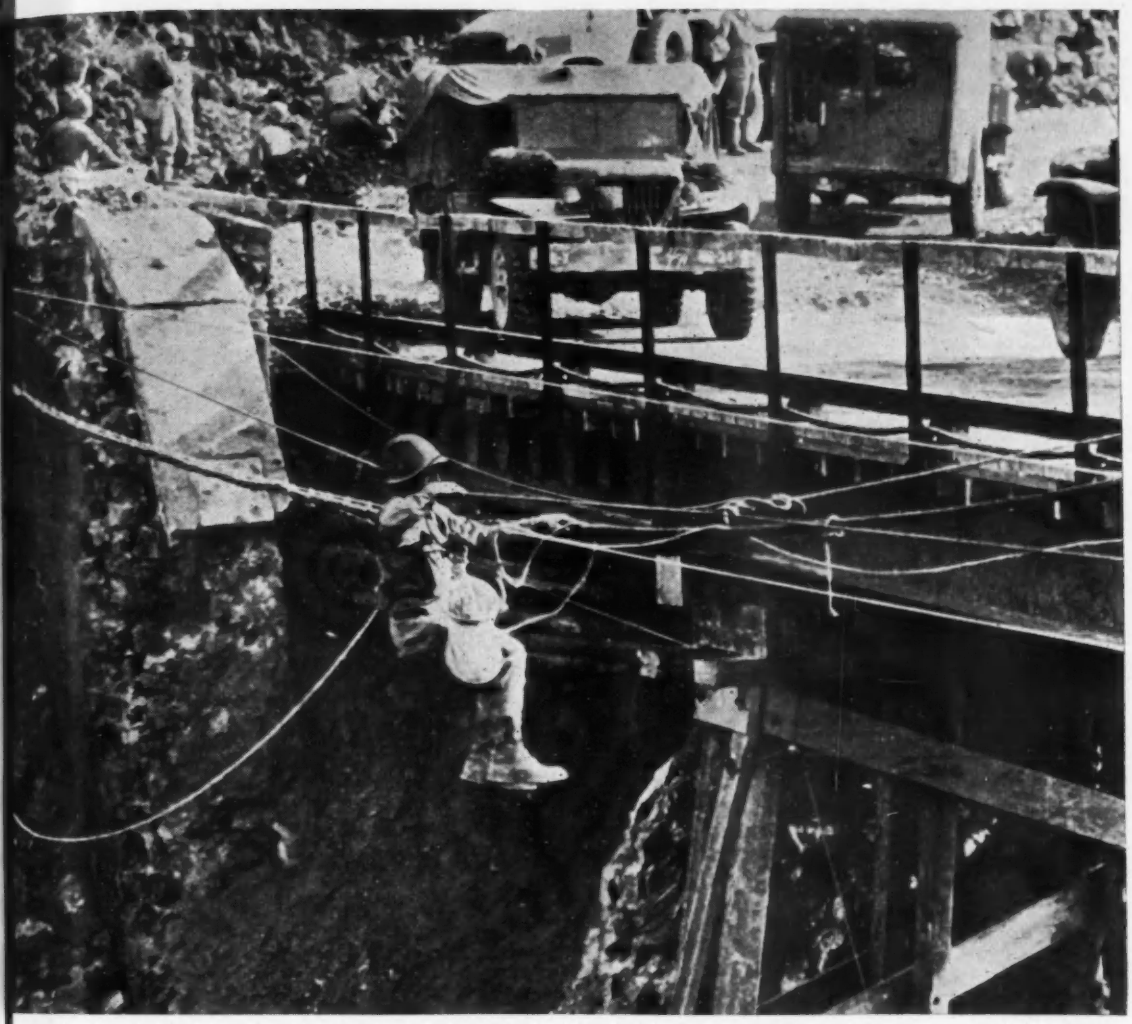
V V

Rate Rebate Order Considered In Michigan Bell Case

Concluding a hearing on rates of the Michigan Bell Telephone Co., the Michigan Public Service Commission had under consideration on December 27 an order for a rate rebate to avert federal excess profits taxes estimated at $4,851,000. (TELEPHONY, December 3, page 26.)

J. W. Williams, assistant attorney general, contended December 26 that the commission should eliminate $250,000 of an $8,740,000 depreciation charge and $1,004,000 due the American Telephone & Telegraph Co. under a licensing contract, as well as the excess profits tax.

(Please turn to page 28)



Members of a Signal Battalion string telephone cable beside bombed bridge. This is the type of work for which the Army needed civilian volunteers

ell System
able Splicers
lown to Europe

"SEND thirty cable splicers immediately"... that was the gist of an urgent request from the Army shortly after the Normandy break-through.

The men were needed for building communications lines behind the retreating Nazis. Signal Corps forces already there were doing a great job but they needed help — and quick!

Many telephone men volunteered for this emergency overseas duty. A number were selected, granted leaves of absence, given physical examinations and flown across the Atlantic.

There are 59,000 Bell men and women in uniform. Practically all the Bell System manufacturing facilities are on war work. That's the way we know you'd want it to be — even though it means waiting for home telephones.

BELL TELEPHONE SYSTEM

IF YOU'RE WAITING FOR A HOME TELEPHONE *we'd like to thank you for being so patient. You can be sure we are doing everything we can to make the widest possible use of available equipment.*

One Thing Never Changes ...QUALITY

Methods of making pole line hardware may change. Supply varies. But, in Line Material Hardware there's one constant, unchanging feature . . . QUALITY!

Nowadays that's particularly important. Why? Because that consistent high quality that's built into L-M products cuts down on replacements. It helps save metal by doing so . . . it helps save machinery . . . it helps save labor.

Quality isn't something new to Line Material Hardware . . . something that grew out of circumstances that make extra care necessary. It's something that's been in every piece of L-M Hardware for over 30 years . . . anchor rods, bolts, clamps, guards and all the other members of that big, famous family.

That's why so many telephone men "play it safe" and depend on L-M to hold their lines.

LM

LINE MATERIAL PRODUCTS INCLUDE

ANCHOR and GROUND RODS
BOLTS BRACES
HOUSE and POLE BRACKETS
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CABLE GUARDS and STRAPS
CABLE SUSPENSION CLAMPS
GUY WIRE PROTECTORS
LAG SCREWS POLE STEPS
STEEL PINS
WASHERS (Round and Square)

—and other Hardware for Telephone Line Construction

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Karl F. Oehler, general attorney for the company, renewed a motion for more time to study exhibits submitted by the city of Detroit in support of the rebate. He declared that the company, its employes and the public would suffer by a rebate order. Since excess profits taxes probably will continue, he said, the proposed action "takes on the aspects of a permanent rate reduction, in piecemeal."

At a prior hearing on December 21 an immediate reduction of $5,151,000 in Michigan Bell Telephone Co. rates, the total to be applicable to December, 1944, business, was recommended by the city of Detroit.

The recommendation was made by Richard A. Sullivan, Detroit rate analyst, under direct examination by James H. Lee, assistant corporation counsel, as he completed the introduction and explanation of 101 exhibits to support his conclusions.

The company's earnings now are at the rate of 5.48 per cent and the proposed reduction would reduce the rate of return to 5.1 per cent, Analyst Sullivan testified. The actual cost to the company, he said, would be only $747,000. The balance is made up by "avoidable" federal excess profits taxes of $4,404,000.

Thomas N. Lacy, vice president and general manager of the Michigan Bell, testified on the same day that intrastate telephone rate reductions in Michigan since 1933 total $4,088,000; that basic wage rates paid by the company have been increased 27 per cent since 1941, and that if wage demands now before the War Labor Board are granted, the total payroll will be increased about $6,500,000 a year.

A steady stream of capital will be necessary in order to carry out the large construction program which the company plans to undertake when the war ends, he said.

Raymond Foulkrod, plant extension engineer, testified at the hearing that the Michigan Bell Telephone Co. plans to spend $120,000,000 in a postwar expansion program to begin immediately when materials are available and to extend over a period of five years.

The company, he said, must first take care of 100,000 orders for telephones now on the books, and expects an immediate growth of from 250,000 to 380,000 subscribers.

Included in the postwar program, Mr. Foulkrod said, is a plan for a complete intercity dialing system in the Detroit suburban area.

"The difference between a meager return, and an adequate return, that is, adequate in the sense of assuring a constant flow of equity capital," Mr.

Lacy testified, "can well mean the difference between good service and service which is less than that to which the public is entitled."

V V

Dismisses Application for Order Clarification

The Oklahoma Corporation Commission on December 27 dismissed the application of the Southwestern Bell Telephone Co., for clarification of its order of February 12, 1942, in which it ordered the company to give Oklahoma City exchange service to 29 persons then residing in the area served by the Nicoma Park (Okla.) Telephone Co., east of Oklahoma City. (TELEPHONY, December 23, page 29.)

The commission held that the order requires no clarification as it applies to only 19 of the persons who still live in the area and whose names were listed in the 1942 order.

Persons named in the original order were notified by the Bell company in July, 1942, that their applications were cancelled because of a War Production Board order which made it impossible for the company to give service at that time. Since then, the commission found, this restriction was removed by the WPB and the company can give service as soon as material is available.

The commission found that all 19 of the original applicants should have their applications reinstated as of the date of original filing since applications are filled in the order they are filed.

The order did not take up the question of relocating the boundary line between the Southwestern Bell and the Nicoma Park exchanges as that was not directly involved in the Bell application for clarification.

V V

Minnesota Commission Approves Sale of Manchester Independent

The Minnesota Railroad & Warehouse Commission on December 28 granted the joint application of the Manchester (Minn.) Farmers Telephone Co., seller, and the Manchester-Hartland Telephone Co., purchaser, for permission to sell and transfer the telephone property in Manchester and Hartland, Freeborn County. It was stated in the order that authorization of the sale was not to be construed as approval of any increase or change in rates and charges or diminution of service in the territory now served by said property.

In its approval the commission gave no consideration as to the value or price paid therefore.

It was found that the Manchester-

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RECOMMENDS—

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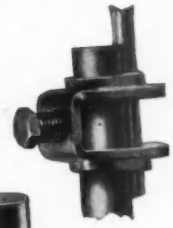
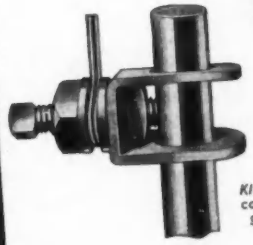
CLAMPS
FOR GROUND CONNECTIONS

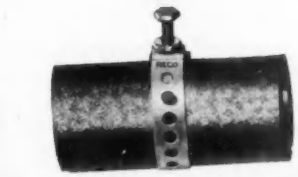
Reliable Clamps include a complete range of sizes and styles for all telephone, radio and signal circuit station grounds. These clamps are fully described in Reliable Telephone Specialties Bulletin. Request your copy.

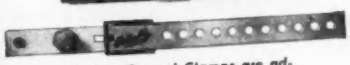


Ground Rod Clamps for ½", ⅝" or ¾" steel or copperweld rods.



Kling Klamp for copper or iron ground wires.





Station Ground Clamps are adjustable for grounding to water pipe.

"RELIABLE"
IDENTIFIES THE QUALITY

COOK TYPE "O"

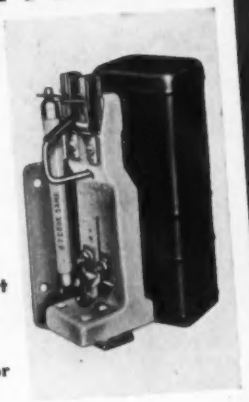
Sub-Station Protectors

★

Built to "TAKE IT"

★

Single Circuit Protectors for Indoor and Outdoor Use



The Type "O" single circuit protector with one pair of fuses and one pair of high potential dischargers is unexcelled for both indoor and outdoor use.

The sturdy body of the Type "O" is a single piece of heavy white glazed, low absorbent porcelain, designed to prevent surface leakage. Phosphor bronze fuse and lightning arrester clips are securely fastened to the body by Everdur bolts.

The Type "O" Sub-Station Protector is made for various types and lengths of fuses. Fuses are 5 amperes and blow at rating. When specified, either higher or lower rating will be furnished.

Type "O" Protectors have a round hole in the porcelain base for small size lead-covered, rubber-insulated cable for underground distribution, or where circuits pass under railroads, roadways, etc.

COOK ENGINEERING GUARANTEES TOP PERFORMANCE

STROMBERG-CARLSON COMPANY
Factory and General Offices: Rochester 3, New York, U. S. A.
Branch Offices: Chicago, Kansas City, San Francisco, Toronto

Hartland Telephone Co. does not own or operate any other telephone properties in Minnesota.

V V

Commission Denies Delinquent Payment Charge

Application of the Canute (Okla.) Telephone Co. for authority to charge a 50-cent penalty to rural subscribers who fail to pay their bills within the grace period, was denied by the Oklahoma Corporation Commission on December 27. (TELEPHONY, December 23, page 29.)

The commission held: "The application should be denied since telephone companies collect the rental charge in advance and operate their exchanges on advance funds collected from the subscribers. If the application is granted, all other telephone companies in Oklahoma would be entitled to the same relief when any relief is needed."

V V

Requests Rural Rate Increase

Mrs. Emory Compton, manager, Oney Telephone Exchange, Albert, Okla., recently filed an application with the Oklahoma Corporation Commission requesting permission to increase rural subscribers' rates from $4.00 to $6.00 a year. The reason assigned for the application was the increased cost of materials and labor. Hearing was set for February 14.

V V

Summary of Commission Rulings and Hearings

Federal Communications Commission

December 21: Granted special permission to American Telephone & Telegraph Co. to amend tariff FCC No. 156, effective January 1, on not less than one day's notice, to provide for discontinuing traffic arrangements from Jessup, Ga., to Hollywood, Fla.

December 27: Granted authority to American Telephone & Telegraph Co. and Illinois Bell Telephone Co. to supplement existing facilities between Chicago, Ill., and Minneapolis, Minn., and other points. Estimated cost, $566,000.

December 27: Granted authority to American Telephone & Telegraph Co. to supplement existing facilities between St. Louis, Mo., and San Antonio, Tex., and other points. Estimated cost, $1,114,000.

Illinois Commerce Commission

December 26: Hearing on complaint of Louis Dann, William Tarsch and Morton Leviton, on behalf of R & K Club, Chicago, against Illinois Bell Telephone Co. as to removal and discontinuance of telephone service by respondent. Postponed from December 12.

Oklahoma Corporation Commission

January 16: Hearing on application of Gracemont (Okla.) Telephone Co. for authority to increase rates.

Wisconsin Public Service Commission

January 5: Hearing on application of Wind Lake (Wis.) Telephone Co. for authority to install a switchboard at Waterford and establish urban rates there. Postponed from December 13.

V V

"Zat Chew Myrt?" "Yes," Says Mae Mahoney

It sometimes takes outsiders to see the romance and human interest side of a telephone operator's job. Recently the Milwaukee (Wis.) *Journal* gave wide publicity, in word and picture, to Miss Mae Mahoney, contractor at the Merton, Wis., exchange of the Commonwealth Telephone Co. The story follows:

"Mae Mahoney's is doubtless the best known voice in Merton. For more than 30 years her crisp 'Number, please?' has answered every call through the village switchboard.

"Mertonites call Mae when they want to know bus schedules, what movies are playing, when church starts or a good recipe for chocolate layer cake. They

THE INDEPENDENT TELEPHONE INSTITUTE, INC.

(A company of the Gary Group)

E. C. Blomeyer, President **A. E. Carlson, Vice President and Treasurer**
C. J. Berlin, Secretary

The Institute has been organized for the purpose of obtaining professional research of, and making findings upon, matters of importance to the telephone industry.

To that end, eminent specialists have been engaged to professionally research and make conclusions upon engineering, legal, tax, economic, accounting and other pertinent phases of each subject dealt with.

The service is performed for clients. The Institute's findings will be made public when the client permits.

In addition to other subjects, the Institute has now under way research upon two matters of great current interest, namely:

"The Farm Telephone Problem," and

"The Effect Upon Independent Telephone Companies of the Proposed Rural Telephone Administration."

Address Inquiries to:

E. C. BLOMEYER, *President*

THE INDEPENDENT TELEPHONE INSTITUTE, INC.

Room 1860, 332 South Michigan Avenue **Chicago 4, Illinois**

all say she is the real life 'Myrt' of the Fibber McGee and Molly radio program. Only one subscriber calls her Miss Mahoney.

"Wearing a bright paisley print frock and a big smile, she talked about her work one evening. She was sitting at the desk size switchboard that has been in the dining room of her home for 30 years, and her fingers played over the keys and cords as calls came through.

"She was the first telephone operator this village of 254 had. She was 15 years old then, clerking in a store. The Merton Telephone Co. was organized and installed a switchboard in the store. Mae took over as operator. When the switchboard was moved to the general store she went with it, and, except for a short while, Mae has been with the switchboard ever since. In 1914 it was put in her home. Ownership of the company changed twice, first when the local stockholding company sold out to the Central Telephone Co. and again about 1930 when it was bought by the Commonwealth Telephone Co., Madison, which now owns it.

"The Mahoney dining room is the telephone office. There's a pay-station on the glassed-in front porch. Mae's friends go into chat with her while she works, sitting around the dining room table. They even manage a bridge party in the evenings when the board buzzes less demandingly. The last day of every month the room is crowded with bill payers.

"Mae's sister and a visiting cousin from Milwaukee help out now and then so Mae can get in a little social life.

"She recalled that the only time she closed up the house and went away was for a month in 1923 when a violent sleet storm grounded the lines and the Merton Telephone Co. didn't have a fat enough treasury to put them up right away.

"It's a night and day job, and Mae takes it seriously, although, she chuckles, 'It's a good thing I have a sense of humor.' Her bedroom opens directly off the dining room and the night bell can rouse her from sleep at any hour —and frequently does.

"On the wall beside her are the red fire alarm box, a clock and framed copies of company regulations. . . .

"Folks who are going away for a day often tell Mae not to bother to ring their telephones. Sometimes it puzzles Milwaukee operators to have Mae tell them there's no use trying the number they're calling, for the family won't be home until later.

"Merton really appreciates Mae in emergencies. Martin Weber, who runs a farm just outside the village, manages the ball games in the Land O'Lakes League, and that used to mean maybe 60 games scheduled for a Sunday. If it rained, hundreds of calls had to be made. Mr. Weber says Mae handled them all without a murmur. Others remember a time when the condensary was in operation in Merton and all the roads into town were blocked by snow. Mae called from one farm to another to arrange to have the milk relayed in. She feels her responsibilities when sickness strikes a home. Once when snow had closed the roads, a local doctor, attending a difficult childbirth, had to consult a specialist in Milwaukee by telephone. Mae stayed at the

"DOWN-TO-EARTH" PLANNING

• Here's how to do a practical job of planning that will lower the costs of tomorrow's pole-line construction and maintenance work: Start a check-up now on weak, worn and missing tools. Plan to re-equip — all down the line — with OSHKOSH tools for digging and pole handling, as soon as the time is right.

Every Oshkosh tool is particularly developed for pole-line service. Special steels, of just the right type and hardness, minimize wear and deformation. Straight-grained wood handles give fine balance and long-lasting strength.

Like so many other nationally-known telephone supply items, Oshkosh tools reach you locally via GRAYBAR'S nationwide network of over 80 warehouses. In addition, GRAYBAR'S experienced staff of Specialists on telephone and pole-line problems is on call when needed.

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Everything Electrical GraybaR ELECTRIC COMPANY

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switchboard all night to help him get his call through.

"All fire calls go to Mae, and she rings the alarm that brings out the volunteer fire fighters.

"There was one time when even Mae, whose competence is legendary, got rattled. A man telephoned in to report his chimney was on fire.

" 'Ring the fire department,' he shouted.

" 'Do you want it right away?' Mae asked smoothly.

"But Mae wouldn't trade her job, troublesome as it may be at times, for any other.

" 'I hope I go before the switchboard does,' she muses. 'I don't know how I'd get along without it'."

Associated Company Assures Re-Employment to Veterans

In line with the policy of many telephone companies, C. F. Mason, president, Associated Telephone Co., Ltd., Santa Monica, Calif., recently sent a letter to the company's employes in the service concerning re-employment with the company following their discharges from the various branches of service.

Mr. Mason's letter follows:

"As our fourth war Christmas approaches, those of us who are left at home are thinking more of our men and women in the service, for at this season of the year in particular we like to have about us the members of our home and our business families, our relatives and our friends. In all of our minds is the hope and in all of our hearts the prayer that before another Christmas our loved ones and our working comrades will be back with us again, and that our respective family circles once more will be complete.

"I should like to say to all of you men and women who left this company to enter the various branches of our country's armed forces that there will be a place for each of you in the company circle when you return. Your loved ones await you with open arms in your respective homes: Your welcome back to the company will be similarly warm. If any of you have been worried about your employment with the company after your return, please remove all doubt from your minds. We want you back and we shall need your help in the work to be done here after the war.

"During your absence there have been some changes here at home. Some of the faces which were familiar to you are no longer with the company. Death has taken some of our best loved comrades, and new people have joined the organization. Some of our work methods have been modified by the war's demands and in some respects we may not return completely to the conditions we knew a few years ago. I think that none of us will suffer from these changes, however, but you who have been away during this period may perhaps find it necessary to adjust yourselves to new conditions. Be assured, though, that your comrades here in the company will make the adjustment as easy for you as possible. Meantime, let us know what you, yourself, think about your return to the company. Write me a letter, if you will, on the subject, for I should like to hear from you personally.

"Were it possible for me to do so, I would like to visit each of you in the camps or bases where you are stationed in this country, or see you on the deck of your ship, or in your airplane or foxhole, to shake your hand and to convey to you my greetings for the season. Failing that, I hope that this letter will express to you my profound and sincere best wishes. May this Christmas bring you in greater measure God's blessings and protection, and may the New Year give you renewed hope for peace and an early return home. We want you back."

HELP WANTED—MALE—Con.
HELP WANTED—MALE—Con.
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Here's News!!!
WORK WANTED
No shortage of properly trained and experienced MAN POWER here to take over your TELEPHONE DIRECTORY ADVERTISING, handle all details, and produce MORE NET REVENUE.
Write or Call At Our Expense
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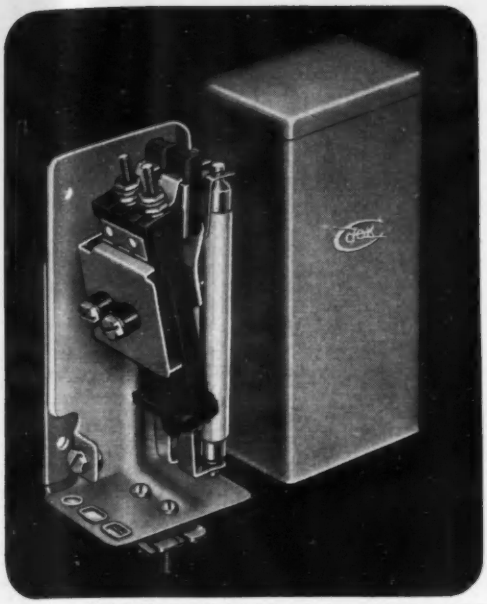
Illinois Independent Gets Dial Equipment

Work of installing dial telephone equipment in Edinburg, Ill., is virtually complete, O. E. Daggett, superintendent of the Illinois Consolidated Telephone Co., said December 16.

This will be the third exchange served by the Illinois Consolidated company to have dial equipment.

In addition to this recent improvement, the company is installing additional switchboard equipment in its Taylorville, Ill., exchange, which will probably be put in service within two months.



Illustrated above is the Type "RO" Sub-Station Protector. The "RO," with hood, is for outside protection. The "RI," without hood, is for indoor protection.

COOK type "R"

SUB-STATION PROTECTOR

Engineered for top performance and constructed with skilled precision, the Cook Type R Sub-Station Protector is "Right." Men who have bought the Type R Protector, telephone engineers and maintenance men who have examined them and used them will tell you how the "R" can take quick, rough handling and subscriber abuse without danger of breakage. They will tell you about the Type "R" and its dependable operation when danger strikes.

The TRANS-MOUNT SYSTEM

The Trans-Mount System is a standardized method of interchangeable protectors for central office protection and cable termination; substation protection for subscriber drops and installations; cable and subscriber distribution at the pole; protection for small cables and open wires; aerial to underground cable termination and distribution; and a variety of additional applications.

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WLB Plans to Set Up Telephone Panel

Plans to establish a national panel to make recommendations to the War Labor Board on cases involving the telephone industry were announced on December 21. The WLB said that all regional boards were instructed to forward to the panel all pending cases. Disputed cases which have been set for regional hearings will be conducted as scheduled, but reports of the hearing agents will be sent to Washington.

Theodore W. Kheel, executive director of the board, was said to be preparing a report of the board dealing with questions of the panel's jurisdiction, its structure and procedure.

Final details are expected to be announced following a scheduled meeting of the board on December 27. The jurisdiction of the new panel was discussed at an earlier meeting on December 18 between officials of the American Telephone & Telegraph Co., United States Independent Telephone Association and the National Federation of Telephone Workers. USITA representatives were H. V. Bozell, V. E. Chaney, R. A. Lumpkin and Clyde S. Bailey. Bell representatives were Assistant Vice President Sanford Cousins of AT&T, T. Brook Price and Walter Gordon Merritt, attorneys. The National Federation of Telephone Workers was represented by its president, J. A. Beirne, and Vice President John J. Moran, as well as its general counsel, Aloysius Philip Kane.

It was expected that the panel will be composed of two members each representing public, industry and labor, with alternates and substitutes for each. Substitutions may be made in the labor representatives in those cases which may arise involving AFL, CIO or other union organizations not affiliated with the National Federation of Telephone Workers. It was not immediately determined whether the panel's work would include cases involving Independent manufacturing companies or Bell manufacturing subsidiaries, including Western Electric and Bell Laboratories.

V V

AT&T Views Resumption Of Service to Europe

The outbreak of World War II resulted in a great curtailment of overseas radio-telephone service, particularly with European countries. In view of recent war news from Europe, the situation seems to have reached a point where the Bell System can take steps to re-establish and develop its communication services.

Accordingly, William G. Thompson, assistant vice president, AT&T, who is in charge of overseas radio-telephony for the Long Lines Department, recently crossed the Atlantic Ocean to explore such possibilities.

Members of a Signal construction battalion use a native canoe as a means of transportation to splice and tie in at Madhnagar, in the monsoon-swollen land of India. Poles were set and one circuit strung during the dry season. At present, more circuits are being installed.

V V

Telephones for Help, Mortar Shells Silence German Guns

When Sgt. Cloyce King, Manchester, Conn., was pinned down by German snipers in the Alsatian underbrush in France, he just picked up a telephone and called for help.

He was out in front of his 45th division mortar squad establishing an observation post to direct fire on enemy entrenchments. He was laying wire when bullets started whizzing over his head.

Sergeant King dropped into the underbrush, then suddenly remembered his telephone.

"My fingers were all thumbs as I connected the telephone to the line," he said. "Someone back there got busy and did some real shooting."

Mortar shells dropped on the German position, silencing their guns.

BUY WAR BONDS V BUY MORE BONDS

Dove Hunters Cause Breaks In Telephone Lines

Sharpshootin' Texas dove hunters, those nimrods who occasionally miss their mark, caused three times as many breaks in telephone lines during September as in any other month this year.

Fearful that the nation's wartime communications system may be impaired at the present rate, A. L. Edmonson, divisional commercial superintendent of the Southwestern Bell Telephone Co., extended a plea to marksmen to watch their shots.

V V

Accept Positions with Maine Independent

Mr. and Mrs. Ewing M. Babcock recently accepted positions as manager and wire chief, and chief operator, respectively, from the Standish (Me.) Telephone Co.

Mrs. Babcock formerly was employed as an operator by the New England Telephone & Telegraph Co. for 17 years. Mr. Babcock, too, worked for the New England company and also for the Kearsarge Telephone Co. at its New London, N. H., exchange for several years.

ABC of the TELEPHONE

(Concluded from page 12)

resistance across the contacts of the push button, the property of condenser capacity is used to neutralize the detrimental effect of the self inductance of the coil winding. When the push button is opened the sustained current merely adds to the charge of the condenser instead of forcing an arc. The flexibility capacity of the condenser, compared with an air tank, makes possible its use in this manner. Used as a cushion the condenser acts much as does a surge chamber in a high pressure water line.

Fig. 19 shows a high pressure water line considerably above city main pressure. A valve is placed in the line, and just ahead of the valve is located an air chamber, commonly called a surge chamber. When the valve is opened there is not a full head of water, because it takes some time to set a body of water in motion. During this time energy is stored in this volume of water, because of its speed of movement.

If the valve is suddenly closed the pressure on the line, plus the momentum of the moving body of water, has to be stopped. This combined pressure is many times greater than the normal line pressure. The surge pressure forces the water into the air chamber, compressing the air, the air offers a counter pressure which slows down the momentum of the water. A moment later the air pressure in the surge chamber overcomes the surge pressure in the line, and forces the water back into the line. This action absorbs the surge without damage to the system.

In the high pressure water line the surge chamber absorbs the shock when the flow of water is stopped. The condenser serves the same purpose when used as a cushion for circuit discharge. It absorbs the current which otherwise would arc across the opening switch contacts.

(To Be Continued)

V V

Killed in Action

LIEUT. WILLARD C. HEDGE, 32, for a number of years connected with the Lincoln (Neb.) Telephone & Telegraph Co. commercial department, was reported killed in action on November 14. He is a son of VERNE HEDGE, former Lincoln mayor.

every LINEMAN a KLEINMAN!

WHEN Mathias Klein first dedicated his little forge shop to the manufacture of fine tools, the new force of electricity was just beginning to affect the lives of millions of American citizens.

Since that time, one generation of linemen has passed the word to the next: that for the tough job of keeping communications open—of keeping power flowing—only the best in equipment is good enough.

Linemen's pliers and wrenches, belts and straps, climbers and grips have kept pace with the amazing technological advancement in the electrical industry. But this equipment today has this in common with the equipment that the pioneer lineman used—it still carries the name Klein.

In 1945, as when the first wires were strung, America's linemen are still Kleinmen.

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Foreign Distributor:
International Standard Electric Corp.
New York

This book on the care and safe use of tools will be sent without charge upon request.

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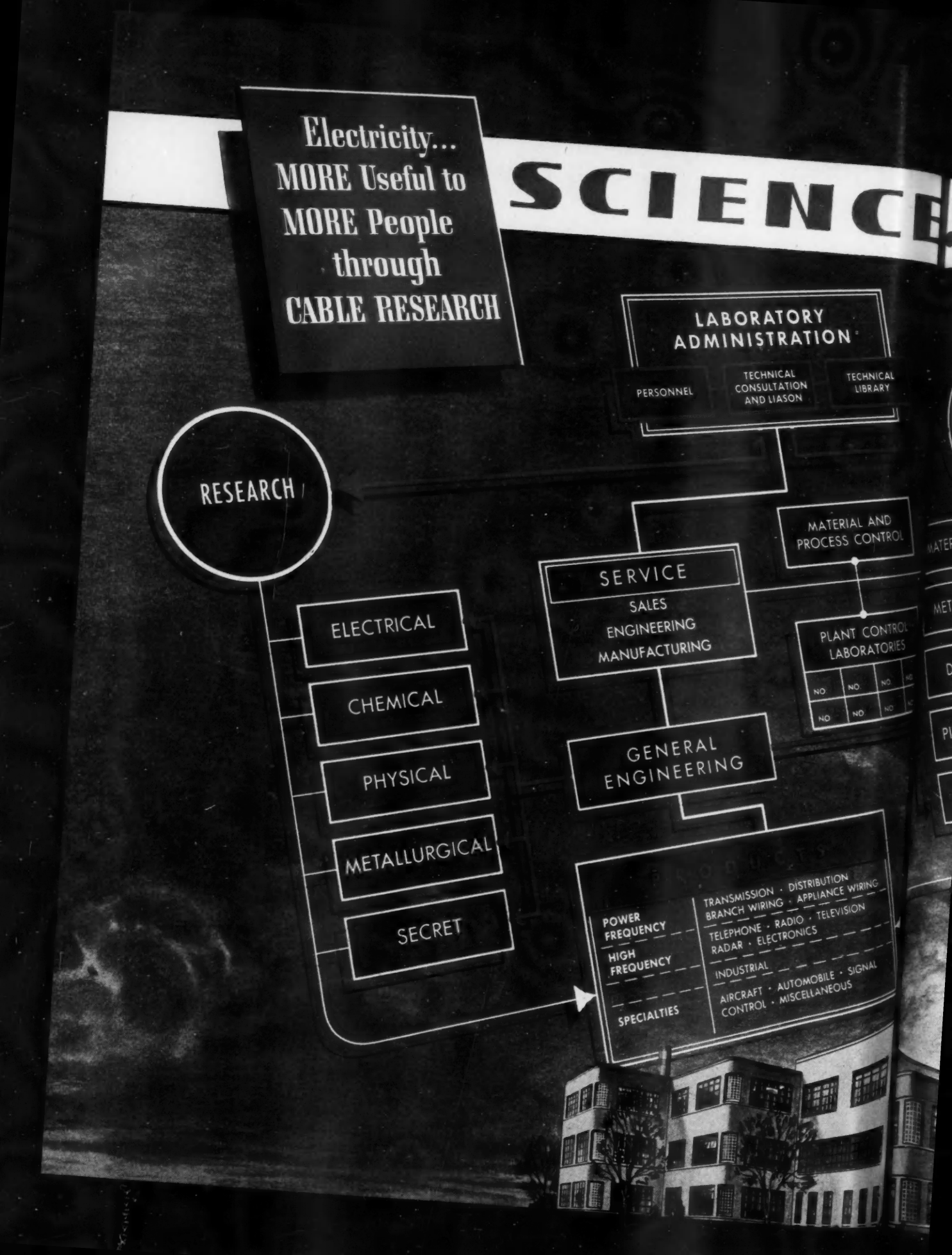
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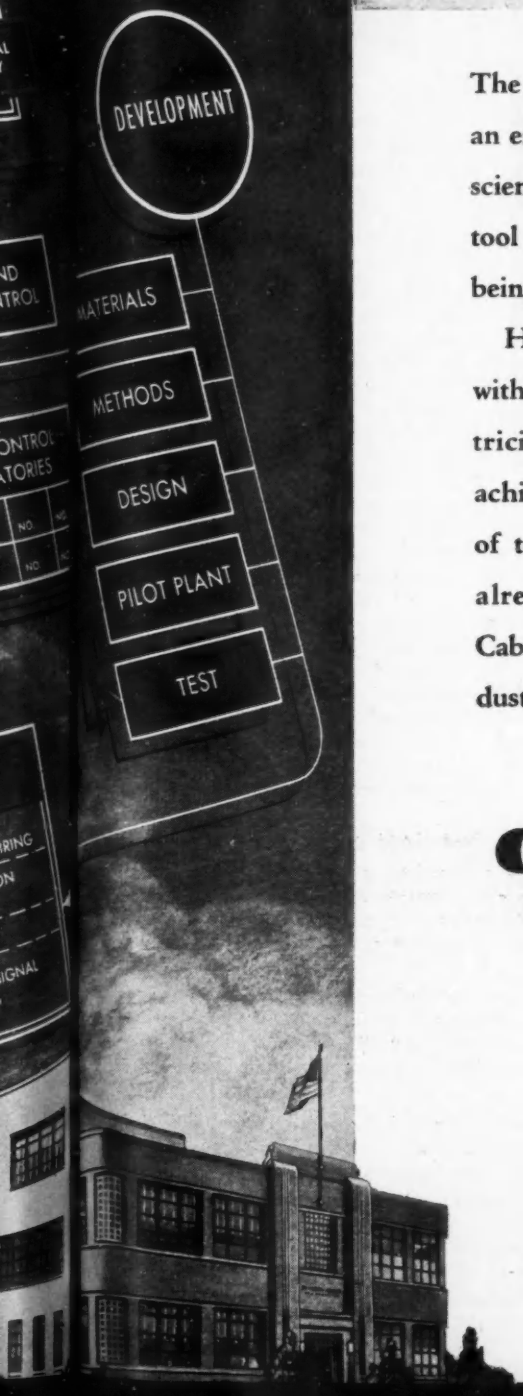

The General Cable Research Laboratory is by no means an end in itself. The great, new building, its facilities and scientific equipment are but an impressive and efficient tool in the hands of the men who are bringing into being this Company's far-visioned industrial program.

Here, pure and applied research go hand in hand with product development, to extend the use of electricity more usefully to more and more people. The achievements now in the making and the achievements of tomorrow will complement the substantial advances already "on the record", by virtue of which General Cable has won and maintained its position in the industry. Research is the spearhead of progress.

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Two Rochester Officials Retire After Long Service

On January 1, 1945, two executives, Robert M. Bruce, vice president, and Edward W. Wirth, superintendent of buildings and supplies, of the Rochester (N.Y.) Telephone Corp. retired after a long period of service in the telephone industry.

Mr. Bruce began his career on October 15, 1898, as an installer's helper with the then Bell Telephone Co. of Buffalo, N. Y. Within two years he progressed to night wire chief and

R. M. BRUCE

in 1904 became a full wire chief. His technical and leadership ability which qualified him for heavier executive responsibility brought continued advancement and after a series of promotions, at the age of 33 he was placed in complete charge of the plant properties in the Rochester district of the New York Telephone Co.

Following the formation of the Rochester Telephone Corp. in 1921, he was appointed plant superintendent by that company and continued in that capacity until 1935 at which time he became vice president in charge of plant. He held the latter office until his retirement.

E. W. WIRTH

When he entered the executive field, Mr. Bruce brought to it in addition to his technical and managerial ability, an open minded and progressive viewpoint which time never altered. As a result, he has continuously pioneered a forthright personnel policy and his authority in this field is recognized throughout the country. He has addressed numerous public audiences on this subject, one being the USITA convention in 1939.

In private life Mr. Bruce has been an energetic participant in civic activities. In this field also he carried his interest in the welfare of people as indicated by his partiality to youth activities. At the present time he is chairman of one of the Rochester branches of the Y.M.C.A.

Answers to Traffic Questions on Page 18

(1) If a customer gives only a telephone number and asks for the name, address, business, or other information concerning it, say, "I am sorry, we do not have that information." If he gives only a name and asks for the street address, say, "I am sorry, we do not give out that information."

(2) A substitute phrase has not been prescribed. If the customer or someone at the called station suggests that the called party may be reached at another telephone, the operator will attempt to reach the called party at the second station, if the calling party wishes her to do so.

(3) Yes.

(4) When the local operator answers and the calling party asks for Long Distance, it constitutes only one call.

(5) On an inward messenger call, after arranging for messenger service, or receiving a report of BNR, convert the number of minutes or hours estimated as required for the messenger service into clock time and enter this time as the subsequent attempt time.

Mr. Wirth began his telephone career on July 1, 1900, as a storeroom clerk for the New York Telephone Co. in Buffalo. During the ensuing 10 years he discharged various responsibilities in the storeroom and on September 25, 1910, was appointed storeroom inspector for the western division. He continued in that capacity until January 22, 1922, at which time he was recommended by the New York Telephone Co. to the newly-formed Rochester Telephone Corp. as qualified to head the buildings and supplies division.

On the latter date he transferred to the Rochester Telephone Corp. and was placed in charge of the buildings and supplies division in which capacity he continued until his retirement.

In addition to his executive ability, Mr. Wirth was an outstanding amateur athlete with the result that he has made a host of friends both within and without the telephone business.

V V

OBITUARIES

HAROLD M. PRESCOTT, assistant vice president of the American Telephone & Telegraph Co., died suddenly December 26. Death was attributed to a heart attack. He was 58 years old and had been with the Bell System 33 years.

A native of Winchester, Mass., Mr. Prescott was graduated from Dartmouth College in 1909 and entered the Bell System in 1911 as a traffic student at Los Angeles. He became general toll supervisor of the Pacific Telephone & Telegraph Co. in 1919 and division traffic manager for the same company in 1925. In 1928, he transferred to the AT&T company in New York where he soon was made traffic results engineer. He was promoted to traffic engineer on January 1, 1940. He was appointed assistant vice president last October.

Mr. Prescott is survived by his wife and two sons, Capt. Dana S. Prescott, U. S. Army, and Baxter C. Prescott, Washington, D. C.

* * *

JAMES A. HEALEY, 77, connecting company representative of the New York (N. Y.) Telephone Co. until his retirement in 1932, died recently at his home in Buffalo.

A native of Greece, N. Y., he attended the Brockport Normal School and after graduation taught school for about two years before joining the telephone company at Rochester. Jim, as he was known to his many friends, worked in Rochester several years and then transferred to Buffalo where for 31 years he handled negotiations with the Independent telephone companies

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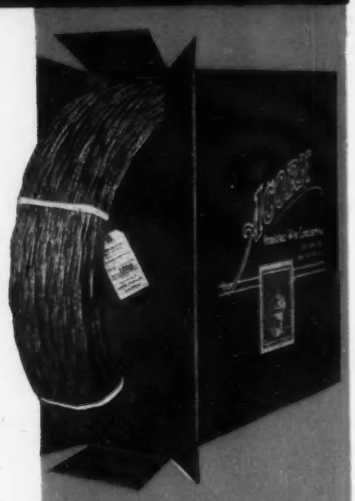

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in the western and central parts of New York State.

Surviving Mr. Healey are his widow and his daughter.

* * *

Z. ZIMMERMAN HUGUS, assistant vice president, American Telephone & Telegraph Co., died December 28 after a long illness. He is survived by his widow; a son, Ensign Z. Z. Hugus, Jr., U.S.N.R.; his mother, a sister and a brother.

Mr. Hugus was born in 1889 in Delmont, Pa. He attended Mercersburg Academy and Washington & Jefferson College, graduating from the latter in 1910. He immediately entered the telephone business at Pittsburgh, Pa., as a salesman. At the time of the First World War, during which he served as a second lieutenant in the Army Air Corps, he was division publicity manager. After military service he became assistant publicity manager at Philadelphia for the Bell Telephone Co. of Pennsylvania. From 1920 to 1925 he was with the Chesapeake & Potomac Telephone Co. where he rose to the rank of general commercial supervisor in Washington, D. C.

Mr. Hugus joined the American Telephone & Telegraph Co. in New York in the fall of 1925 and less than three years later became commercial results and practices engineer. In 1935 he was placed in charge of the commercial division of the company, which post he held until 1940 when he was appointed assistant vice president. At the outset of the present war he was named chairman of the telephone committee of the Board of War Communications.

* * *

ROY CHARLES KIMBAL, veteran employe of the Concord (N. C.) Telephone Co. and manager of its exchange at China Grove, N. C., died December 27. Surviving are his widow; a son, Corp. Roy Charles Kimbal, Jr., with the Marine Corps at El Centro, Calif.; a daughter, a brother and two sisters.

V V

Tons of Signal Equipment Needed For One Invasion

A potent piece of information on why telephone facilities are scarce on the home front was included in the government's recent release on the tonnage of supplies necessary to mount an invasion.

For an invading force of 250,000 men, there are required 50,000 tons of communications equipment for the initial landing, and an additional 1,000 tons to maintain the landing force for 30 days.

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P&H "STILL IN THE LEAD"

Grapevine Aids Suggested for Declining Rural Service

In regard to the decline of rural telephone service a recent dispatch from the St. Louis (Mo.) *Post* suggests that the experts studying this problem look into sociological causes as well as economic.

The item reads as follows:

"A committee of experts is pondering the decline of rural telephone service while subscriptions in cities have increased by leaps and bounds. Beyond a doubt, the difficulty of providing an adequate service at low cost in areas where houses are far apart is partly responsible. . . .

"We wonder, however, whether the experts had not better look into sociological causes as well as economic. City people, living close together, want privacy. Farm people, who see all too little of one another, want news. So maybe one thing needed to restore interest in the rural telephone is more instruments to the line, with loudspeaker extensions to kitchens so that tuning in on the neighborhood grapevine will not interfere with the pea-shelling."

V V

Southern Bell Employes Give Gifts to Recuperating Vets

As a result of a suggestion by Miss Blanche Dellinger of Charlotte, N. C., personnel supervisor of the Carolinas division of the Southern Bell Telephone & Telegraph Co., approximately 3,500 Christmas packages were distributed to overseas veterans who are patients at the Stark General Hospital in Charleston, S. C.

Under the plan, which was adopted by employes of the company in North and South Carolina, each employe contributed a gift to be given to the patients. The gifts were distributed on Christmas Eve by girls from all departments of the Charleston office.

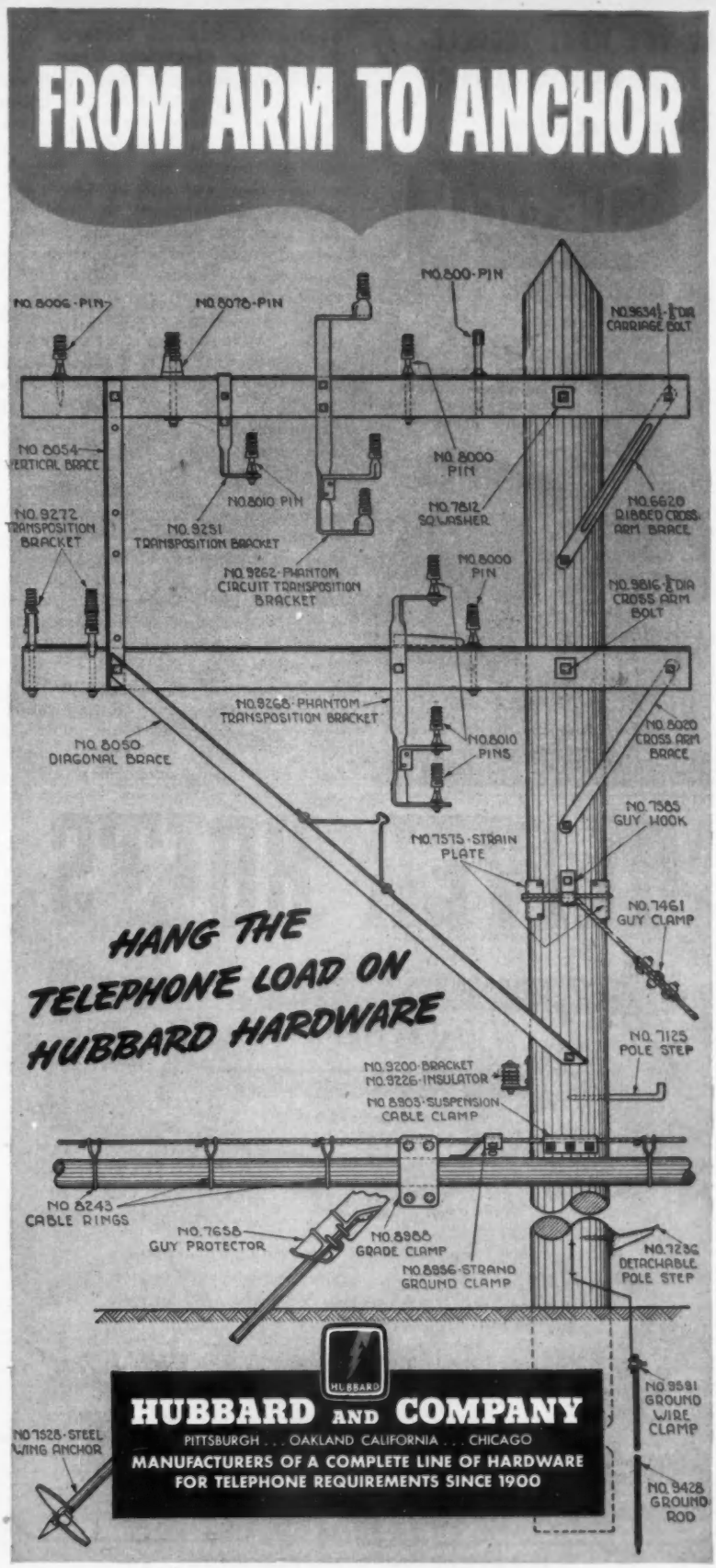
Through the courtesy of the company, a supply of fruit, nuts, candies and cigarettes was made available throughout the holiday for the patients, and according to Ned Huffman, manager of the Stark exchange branch, holiday rates prevailed on Christmas Day calls, with all personnel on duty to help put through Christmas calls home.

V V

Fire Disrupts Telephone Service

Telephone service in Barlow, Ky., was disrupted recently when the W. H. Roland residence, housing the Barlow Home Telephone Co., was damaged by fire.

The exchange was not damaged but the house was so water soaked it took the whole day to dry.



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SUB-CYCLE is built for heavy duty—made in 6 Models for loads ranging from small PBX to large Central Office.

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Synthetics Replace Natural Rubber for Electrical Uses

Synthesis of rubber-like materials is not essentially new. For many years "synthetic rubbers" have been employed to a limited extent abroad. In our own country prior to the war and while rubber was still abundant, considerable development occurred and some materials such as neoprene, thiokol and several synthetic resins were in practical use because of superiority to rubber for certain appliances and environments. Other synthetic materials were in the laboratory stage or just being introduced to industry, according to a recent statement by General Cable Corp.

The outbreak of the war in the Pacific, quickly followed by loss of our principal crude rubber sources, made imperative the intensive development and tremendously expanded production of synthetic rubbers. From negligibly small beginnings to an aggregate annual production rate of 850,000 long tons of synthetic rubbers of various types in a period of approximately two years, is a remarkable achievement. When it is considered that this required an expenditure of $750,000,000 for plants throughout the country, the design of machinery and equipment for the mass production of this new material, and the development of processing techniques not only of manufacture but also of ultimate use, it becomes one of the greatest accomplishments in the history of industry throughout the world, the statement said.

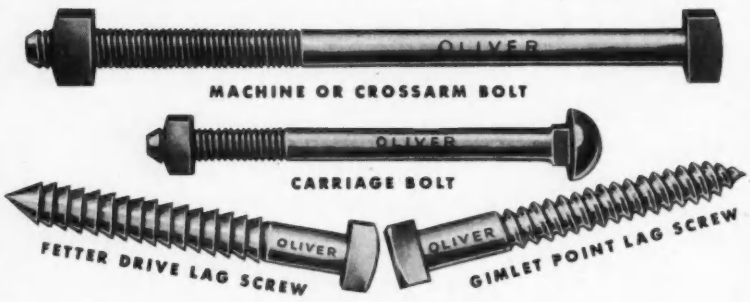
In a sense, this performance of man exceeds nature at its best; it takes about seven years for a rubber tree to start producing, whereas in about two years American industry has reached a production rate of more than 70 per cent of that of all the rubber trees in the world at their peak. Thus, under the urge of war has been born a gigantic new industry which almost certainly will have an important influence on our future economy, it was stated.

It is quite improbable that crude rubber will be available in large quantities when hostilities cease, because in many cases the rubber plantations have been neglected and in some cases may have been destroyed by the Japanese who now control about 90 per cent of the world's plantation rubber. The consumer interest lies in knowing just what will be available for postwar use, together with the degree of assurance with which these new materials may be used to replace natural rubber.

The government selected Buna S, now widely known as GR-S, as the principal, basic material for its synthetic rubber program, primarily because it appeared to be the most practical general-purpose replacement for natural rubber. In addition, it could be manufactured from raw materials which were plentiful, processed with existing rubber equipment, and was suitable for tires which was by far the major use. This synthetic, a copolymer of approximately three parts butadiene (a gas derived from alcohol or petroleum) and one part of styrene (a liquid derived from the distillation of coal tars) is now being produced at a rate exceeding any previous domestic consumption of natural rubber, and has become an important material in the cable industry, the General Cable company stated.

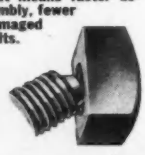
With some modifications of formulation and processing over those previously employed for natural rubber, GR-S yields insulations and jackets of good, and in some respects, excellent characteristics. In comparison with former rubber compounds of equivalent grade, the GR-S compounds are generally characterized by lower tensile strength and elongation and, in the case of insulations, by lower insulation resistance and slightly lower dielectric strengths. Power factor and dielectric constant are slightly higher than for natural rubber. On the other hand, tests and experience to date indicate generally better aging properties and equivalent moisture resistance and electrical stability. Abrasion, tear and com-

OLIVER BOLTS



Included in the complete line of Oliver Pole Line Materials are BOLTS of all types and sizes required for telephone service. A few representative types are illustrated above. For complete details see the Oliver Pole Line Material Catalog.

SPEED POINT... a feature of Oliver Bolts that means faster assembly, fewer damaged bolts.



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IRON AND STEEL
CORPORATION

South Tenth and Muriel Streets, Pittsburgh 3, Pa.

pression values are reasonably good. As in the case of rubber, GR-S compounds have comparatively poor resistance to flame, ozone (except for ozone-resistant insulations) and oil. The same maximum copper temperatures apply for synthetic and natural rubber. In a word, for all electrical uses for which natural rubber has proved suitable, the corresponding grades of GR-S compounds exhibit no important electrical or mechanical weaknesses that will adversely affect operating life or service, it was stated.

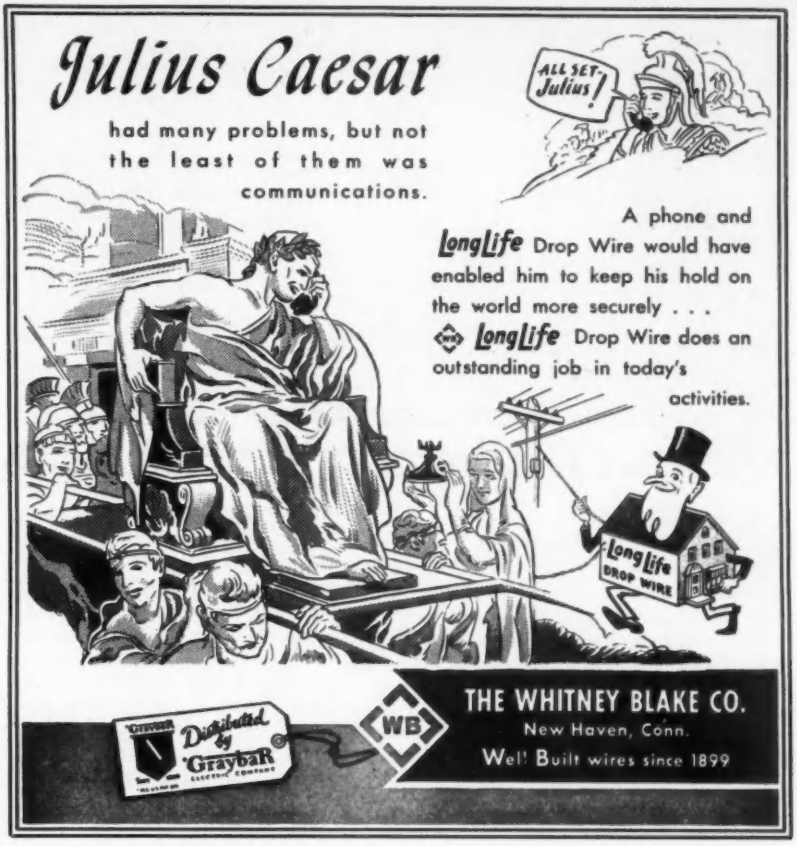
V V

Kellogg Employes Hold Annual Winter Party

Employes of the Kellogg Switchboard & Supply Co. held their annual winter party on December 8 at Chicago's Paradise Ballroom. Elaborately detailed, the affair provided fine entertainment, featuring two well-known Chicago orchestras and a host of distinguished celebrities of stage and radio, the company reports.

Highlight of the evening was the awarding of a score of prizes including war bonds and other gifts. Several committees, representing all divisions of the company, arranged the entire affair. Over 3,000 Kellogg employes attended this annual function, it was stated.

In a visit to the Stromberg-Carlson Co. plant at Rochester, N. Y., screen favorite FRANCHOT TONE looks up at a replica of a Navy Liberator bomber, inspiration of recently-concluded Sixth War Loan Drive for $373,000, at the war communications plant. Another visitor, MARINE CORP. EDWARD WERNICKI, be-ribboned veteran fresh from action in the atolls of the South Pacific, made a stirring address about the importance of bond-buying in an appearance arranged by the U. S. Navy Industrial Incentive Division.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DR. ARTHUR BESSEY SMITH (center) presenting Talbot G. Martin award to T. E. MEYER. K. B. KEEFER, president of the Strowger Automatic Club, donor of the award, is at the left.

T. E. Meyer Wins Talbot G. Martin Award

The Talbot G. Martin Award of the Strowger Automatic Club, employes' organization of Automatic Electric Co. and its affiliated companies in Chicago, was presented at its December meeting to T. E. Meyer, engineering consultant of the company. This award, made periodically to a member of the club who has made outstanding contributions to the art of communications, comprises a handsome bronze plaque mounted on walnut, and honorary life membership in the Strowger Automatic Club. Presentation of the award was made by Dr. Arthur Bessey Smith, and the ceremony was witnessed by more than 150 employes and officials of the company.

The award was presented to Mr. Meyer for his "outstanding attributes, patience, good will, integrity and technical understanding which have contributed much to the propagation of automatic telephony." In presenting the award, Dr. Smith described Mr. Meyer's lifelong interest in making things and making them work, which is an essential characteristic of the engineer. Attention was called also to his outstanding qualities of leadership, as indicated by the large number of engineers and executives now holding responsible positions in the company, who obtained their early training in the engineering department under Mr. Meyer's direction.

In a brief speech of acceptance, Mr. Meyer disclaimed personal credit for his success, and emphasized his desire that the award be considered a tribute to the entire engineering department, which has worked together as a team in the development and propagation of automatic telephony.

Mr. Meyer joined the Automatic Electric organization in 1897, and is now its oldest employe in point of service. He is the 11th member of the Strowger Automatic Club to receive the award which is named in honor of the late Talbot G. Martin, who was for many years in charge of research and development for the Automatic Electric organization.

V V

Plans New Manufacturing Line

Western Electric Co., manufacturing subsidiary of the Bell Telephone System, announced December 11 that it would manufacture television transmitting equipment in the postwar period.

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C. M. Christiansen Co., Phelps, Wis.—Northern White Cedar Poles, plain or butt treated. Quotations on request.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants: Beaumont and Texarkana, Texas.

T. M. Partridge Lumber Co., Minneapolis, Minn.—Northern White—Western Red Cedar Poles. Plain or butt-treated.

Pensacola Creosoting Company, Pensacola, Fla. — Creosoted Southern Pine Poles of Superior Long Leaf Quality.

Valentine Clark Corporation, 2516 Doswell Ave., St. Paul, Minn.—Finished Cedar Poles. Plain or butt-treated.

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WANTED: Man who can qualify as Construction Foreman on light crew, handle cable splicing or install telephones. Age not so much of a factor as ability to learn and to fit into an organization of reliable men who are receiving training for higher positions. Furnish full details of experience, draft status, etc. Certificate of availability required. Write Box No. 2133, c/o TELEPHONY.

HELP WANTED

WANTED: By telephone company in Middle West, experienced repairmen and linemen. Good salary for men who can qualify. Furnish full details of experience, draft status, etc. Statement of availability required. Write Box No. 2126, c/o TELEPHONY.

WANTED: Telephone Accountant—qualified to supervise all phases of telephone accounting for Class A companies. Give full information as to age, experience, draft status, etc. Attach small photograph. Write Telephone Services, Inc., 16th Floor, Lincoln Tower, Fort Wayne, Indiana.

DEVELOPMENT ENGINEERS

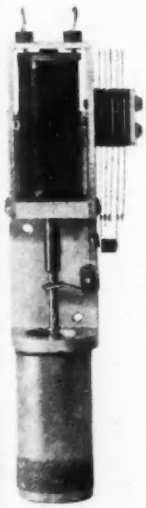
Mechanical and electrical. Graduate or equivalent training. Required for development work in the following branches:

1. **Electro-mechanical devices, communication systems. Must be interested in development and familiar with magnetic circuits.**
2. **Measuring and control instruments. Background should be in electrical engineering, including electronics.**

Statement of Availability Required. Write Box No. 2135, c/o TELEPHONY.

DESIGNER

A Central New England manufacturer employing over 1,000 people needs Draftsman-Designer on telephone and signaling (mechanical) apparatus. Knowledge of die-casting and plastic applications desirable. WMC Regulations Prevail. Write Box No. 2134, c/o TELEPHONY.



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U. S. Rubber Appoints Manager Of Marine Cable Sales

In a recent announcement made by Howard H. Weber, general sales manager of the wire and cable division of the United States Rubber Co., John Blake was appointed manager of marine cable sales, with headquarters in New York City. The new appointment was effective at once.

Mr. Blake started with the company during 1911 at the Bristol, R. I., plant. He left the employ of the company during 1915 for the position of factory superintendent of Bishop Gutta-Percha Co. This firm was dissolved during 1941 and, after being associated with another wire plant, Mr. Blake returned to Bristol as subcontracting manager.

V V

Appoints District Manager

Effective February 1, 1945, J. P. LAWTON will take over the duties of district commercial manager in the Graybar company's Northwestern district with headquarters in Seattle, Wash. He succeeds J. H. KELLY who will retire on a pension after 38 years of outstanding service. Mr. Lawton will have jurisdiction over commercial activities in all Graybar locations throughout the district which includes offices and warehouses in Portland, Spokane and Tacoma as well as Seattle.

HELP WANTED

WANTED: Experienced linemen. Write to The Sussex Telephone Co., Box 253, Newton, N. J.

FOR SALE

FOR SALE: 500 used crossarms, 10 feet standard, 8 pin, complete with pins and braces. Plain or treated. Write Public Service Telephone Co., Montrose, Mich.

FOR SALE: Telephone system, three switchboards in four towns. Fully metallic, 475 stations. Price set at $25,000.00. Write, The Home Improvement Co., Crystal, N. D.

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